PESTS

and their CONTROL

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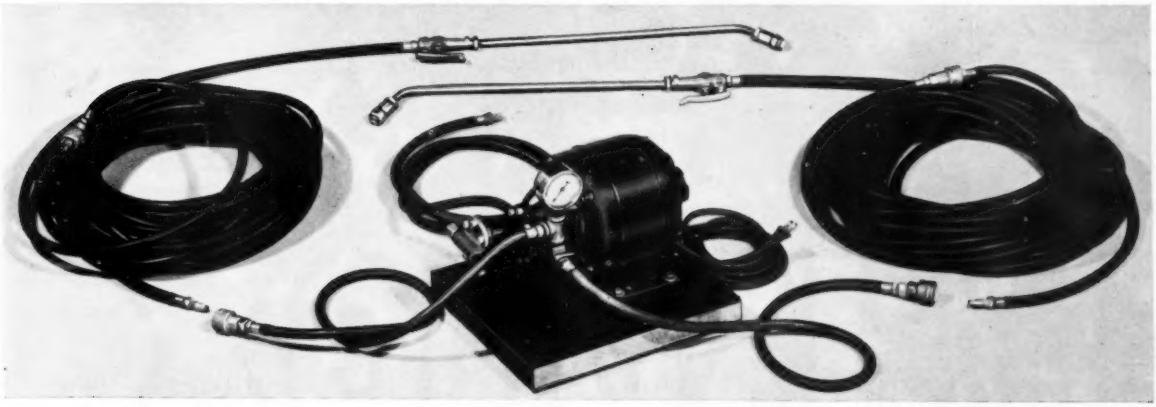

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PESTS and their CONTROL

JAMES A. NELSON
Editor

JOSEPH R. GROSS
Associate Editor

Cooperating with

NATIONAL PEST CONTROL ASSOCIATION

Contributed articles in this publication do not necessarily reflect the opinions of the editors. Discussions, comments and all types of material pertaining to pest control and other sanitation services are invited from those interested in the advancement of the field.

All contributions must be in our hands by the 15th of the month preceding issue for which they are intended.

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CONTENTS

PCOs, Let's Branch Out
By F. Peter Clements 7

Weed Control for the PCO
By Dr. Charles F. Gerlach 9

Killing Woody Plants with Chemicals
By Dr. L. W. Melander 12

New Horizons for PCOs
By Paul Herbert 16

Why the American Medical Association Is Interested in the Pesticide Problem
By Bernard E. Connley, R. Ph. 18

PCO Notebook
By Joseph R. Gross 28

Comments by the Editor 30

Letters to the Editor 32

PCO News 34

Calendar of Events 34

Organization News 40

Pestales 44

Classified Advertisements 46

Advertisers' Index 46

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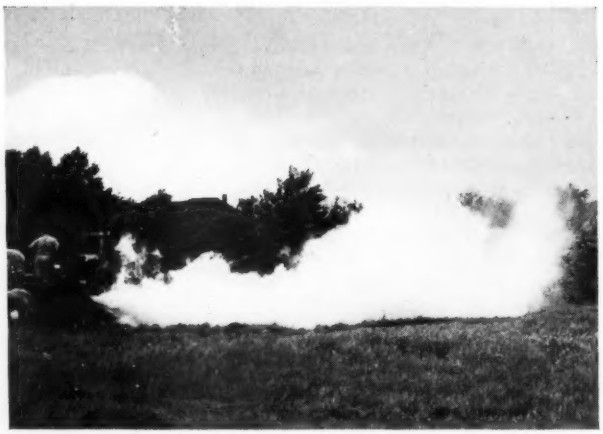

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PCOs, Let's Branch Out

By F. Peter Clements

Mr. Clements wrote some time ago that Clements' Services, Ft. Lauderdale, Florida, is realizing profitable additional income by servicing lawns, trees and shrubs along with regular pest control work. We asked him to tell our readers about it.

WITH INCREASING competition from retail sales of the modern efficient insecticides, and pest control from Government agencies, it becomes consistently apparent that the PCO must increase his scope of services to keep abreast of the times and to continue to give the customer satisfaction. It is with this in mind, PCOs might consider the control of diseases and insect pests in the lawns, trees and shrubs, of their particular area.

This article is not intended to fully explain the operation of such a practice, but merely to bring before the PCO the potential of such a practice.

In Florida, the area remains green the year round; however, the consideration, study and application to your own area might prove profitable during certain seasons of the year.

The first objective in this new phase of pest control is the study of local insects and diseases attacking lawns, shrubs and trees of your particular area. This is no easy task, and it is suggested that you read all available material pertaining to insects and diseases in your area, corroborating with your County Agent in his relative problems. Affiliate with your local Garden Club. Listen to their troubles as regards insect pests and diseases and before long you will find there is a place for a service of this nature in your community. Bear in mind that to get into this type of pest control, you will have to know and identify insects and diseases that most of us never knew existed, and to know what remedy is necessary to control them.

One cannot emphasize the fact that study is most important. In this proposed type of enterprise you will be dealing with living plants, and the wrong application of a chemical to a plant either through ignorance of the properties of the chemical you are using, or ignorance of the hardiness of the particular plant you might be spraying and its ability to withstand certain types of sprays, might prove quite disastrous.

For a beginner in this phase of pest control the types of equipment one could use are many and varied. However, it is suggested that one start with a good power sprayer having approximately a 100 gal. tank, capable of giving a minimum of 400 lbs. pressure at the nozzle, with a gallonage output of from 4 to 7 gals per minute. I have found that for estate or average residence spraying, it is advantageous to have a unit with two separate tanks with a cross-over system, because small jobs often require the application of two types of sprays, that are not miscible. Having the two tanks eliminates the problem of washing out your tank and mixing another solution, which may not be applicable to the next job. In recommending equipment for this type of work, the use of dusters, fog machines or other types of applicators should not be overlooked, but in starting this type of pest control, one must consider the various type of equipment on the market, and obtain one best suited for his needs. It is important to remember that in most cases, a residue left on the plant is desired — an important factor to consider in the selection of equipment.

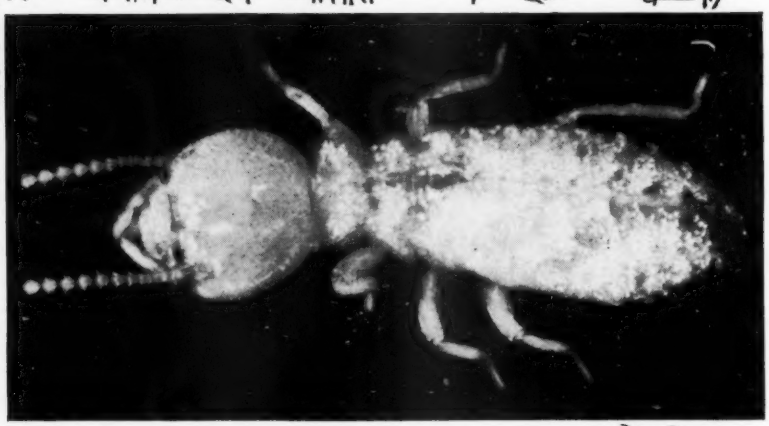
To list the many types of insects attacking the lawns, trees and shrubs in all parts of the nation of course would be impossible in this article; however, Government bulletins, chemical company reports and recommendations pertaining to your particular area are easily procured. As heretofore stated, your problem will be the identification of the insect or pest.

There is an old axiom that still holds good in the control of insect pests in the trees, lawns and shrubs, that might prove of some value to a beginner, and that is: (1) If the insect is of the type that chews and actually devours the leaf or portions of the plant, a stomach poison is recommended, such as arsenate of Lead or DDT. (Wettable); (2) If the insect obtains its food by piercing or rasping the object fed upon, sucking out the juices from beneath the surface, obviously these sucking insects cannot be controlled by the use of stomach poisons applied to the leaf. Such insects often may be controlled by contact insecticides; i.e. nicotine, pyrethrums, Rotenone, thyocyanates, or some refined mineral oils. Examples of such insects might be aphids, thryps, leaf hoppers, mites, etc.; (3) If the insect is of a scale nature, the majority of which are divided into three types, the armored, the unarmored, and the mealy bug, — one satisfactory method of control is with an oil emulsion spray or nicotine sulphate with an activator, or the combination of both. Naturally there are many deviations from this rule as certain insects cannot always be controlled by materials that are effective to the same type of insect. Here again, study is necessary.

There are many new types of insecticides and many old ones that have not been mentioned, that will give good control to infestations, but as stated before, your local conditions must be carefully considered and the manufacturers' recommendations followed closely.

As in general pest control, the method of application of your spray is very important, and must be worked out according to the type of equipment used.

The potentiality for PCOs in the control of insects in the trees, lawns and shrubs is unlimited for, with the mastering of the insect problems, it is inevitable that we will be called upon to control various fungus disorders, apply nutritional sprays, sterilize soils, and from there on the door is wide open. PCOs let's branch out!



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WEED CONTROL for the PCO

By DR. CHARLES F. GERLACH

Technical Service Director, Michigan Chemical Corporation

Picture courtesy National Sprayer & Duster Association

Power sprayer mounted on jeep with boom in front on fairway of golf course for weed killer application.

MODERN CHEMICALS have made weed control a science paralleling insect and plant disease control. Because it requires specialized equipment, knowledge of chemicals, and experienced operators, it quite naturally falls into the scope of Pest Control Operators.

Many PCO's have been reluctant to offer weed control services because they felt that the demand was not there or because it involved too much time and personnel training.

Certainly the demand is here and personnel familiar with application equipment and insecticide chemicals should not be difficult to train.

Control of weeds in and around lawns, parks, resort areas, golf courses. cemeteries, playgrounds, private clubs, public institutions, hospitals, drive in theatres, factories and storage areas should present numerous opportunities for work.

Weeds controlled, chemicals used, suitable equipment and necessary precautions are discussed in this article written for Pests magazine.

Chemicals Used For Weedkilling

Many chemicals are now available for weedkilling and indications are that new and more effective materials will be available soon. A few of these chemicals and their uses are:

2,4-dichlorophenoxyacetic acid, commonly known as 2,4-D.

This chemical is available either in salt or ester formulations. The most common commercial products have been the sodium salt containing 82% 2,4-D acid — a soluble powder form, the amine salts in liquid formulations and the esters of methyl, ethyl, isopropyl, butyl or anyl alcohol in oil solutions. For the control of broad leafed weeds and selective weed erradication in grasses 2,4-D can be generally used. Certain woody plants are sensitive to it, and it has a place in erradication of these in areas where they are troublesome. 2,4-D will probably handle 90% of the weed control necessary to urban areas.

Sodium chlorate and mixtures of sodium chlorate with calcium chloride:

Sodium chlorate may be used

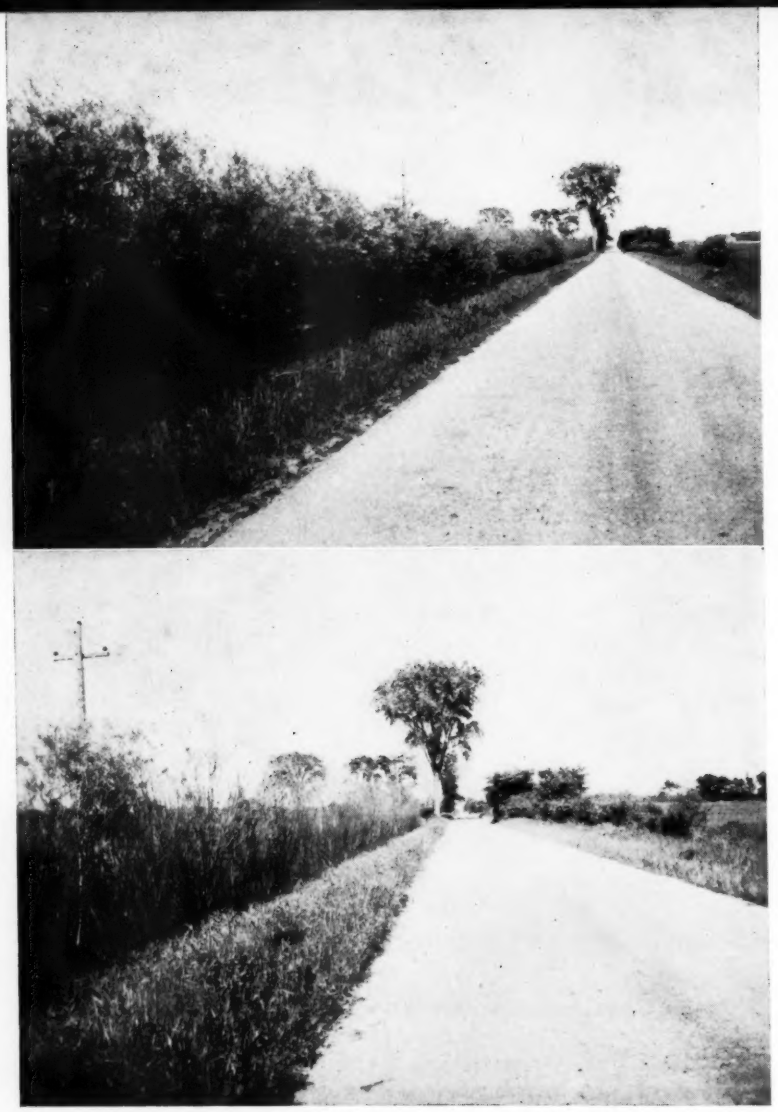
where small patches of noxious grasses or perennial weeds are to be eradicated and the soil can remain non-productive for 2 to 3 years. The mixture is safer and less inflammable than sodium chlorate used alone.

Borax—Borax may be used at the rate of 15-20 pounds per square rod for the control of herbaceous weeds and grasses around elevators, lumber yards, oil installations, tennis courts, arsenals, warehouses, driveways and parking lots where chlorinates might present a fire hazard and where soil sterility is desirable.

Pentachlorophenol—This chemical, looks promising as a contact weedkiller on hard to kill weeds and brush. Oil combinations with 2,4-D have looked promising on grasses and brush in areas where it is not desirable to sterilize the soil.

Ammonium sulfamate—This chemical may be used for the elimination of certain woody plants which are resistant to 2,4-D. It is used at the rate of one pound to one gallon of water and applied so as to thoroughly wet the vegetation.

Oils, isopropyl-n phenyl carbonate, ammonium trichloracetate, dinitro compounds, xanthates and sulfuric acid may be used for the control of certain weeds under specific conditions.



(Above) Heavy growth of roadside brush before treatment.
(Below) Same area two weeks after treatment with 2,4-D.

Equipment

Equipment needed for weed control depends upon the size of area to be covered and the chemicals to be used. Spray solutions can be applied with a small hand sprayer, a barrel or wheel barrow type, or by power sprayers. Light carts carrying a small pressure sprayer of 3 to 5 gallon capacity and a 3 to 4 nozzle boom are practical and effective for lawn treatments. The use of plastic or metal shields around the boom afford wind protection and reduce spray drift. Flat fan shaped nozzles permit uniform coverage and wetting of the weeds. Low spraying pressure of 30-60 pounds per square inch produce a more wetting spray and are less likely to cause drifting of the spray.

Control of Lawn Weeds:

For most weeds occurring in lawns 2,4-D is the answer. Best results have been obtained from spring or fall applications. Early afternoon when the temperature is 80-85°F. is the optimum time for treatment. Applications during cool periods result in slow kills; whereas applications during periods when temperatures exceed 90°F. may result in some injury to grasses. Young seedling lawns or grasses are easily injured or killed by 2,4-D and newly seeded lawns should not be treated until the grass is well established.

Best weed kill is obtained when the weeds are young and growing actively. Applications should not be made before rains or they may be washed off.

In areas where flowers, vegetables or ornamentals are growing use every precaution to avoid drift of the spray on to these plants. The salt forms are safer than the esters for most areas, because they are less toxic in low concentrations and less likely to volatilize and drift after spraying has been finished.

Below are listed some common lawn weeds with recommendations for their control:

Dandelion—Use 2,4-D and make application either in spring, late summer or fall. Late sprayings eliminate seedlings as well as established plants and make for a dandelion free lawn the following spring.

Plantain—Use 2,4-D and make application in spring before seed heads are formed.

Buckhorn—Use 2,4-D and spray in spring before seed heads form.

Goats Beard—2,4-D applied in the spring will give control.

Sour Dock—2,4-D applied in spring or early summer will kill emergent plants. Repeated yearly sprayings are necessary to control emerging seedlings.

Vervains—Spring applications of 2,4-D will eliminate most species. Repeated yearly sprayings may be necessary to eliminate growth from seedlings.

Knot Grass—Spring or early summer spraying with 2,4-D should kill or stunt plants. A combination of fertilizing, lawn seedling and other good lawn practices will be necessary to eradicate heavy growths.

Chickweed—2,4-D spraying of young plants in spring or early summer together with good lawn practices and measures to eliminate shady and moist areas will control this weed.

Mustards—Early spring spraying with 2,4-D will control most species.

Control of Brush and Woody Plants:

Use 10-20 gallons of spray per acre and apply at least one pound of acid in the ester or amine form per acre.

Where brush is heavy it may be necessary to use more water and pressures up to 200 pounds per square inch to secure adequate coverage.

A power sprayer with an orchard type gun has been best under most conditions.

If apple, ash, basswood, birch, wild blackberry, red cedar, cypress, American elm, gooseberry, honey locust, hard maples, oak, osage orange, pines or wild rose are common, spraying with 2,4-D will not give control.

Ammonium sulfamate or 2,4-5 trichloracetic acid are effective on some woody plants not readily controlled with 2,4-D.

Large trees which cannot be sprayed economically may be cut and the trunks treated with a concentrated solution of 2,4-D.

Grass weeds—Some grass weeds may be controlled in the seedling stage with 2,4-D. Established grasses are difficult to erradicate without sterilizing the soil for the next 2 to 3 years. In areas where is is desirable to prevent plant growth over considerable periods materials such as borax or sodium chlorate will give effective control.

Precautions to follow with 2,4-D

Avoid contamination or drift to susceptible plants. Spray on days when there is little or no wind.

Avoid spraying during rains or when rain threatens.

Treat during favorable temperatures and when weeds are actively growing.

Use the salt forms where there is danger of volatile fumes from esters drifting to adjacent valuable trees, flowers, shrubs, ornamentals or vegetables.

Keep up to date with state and federal recommendations on the uses and hazards of weed killers.

Read directions on all materials and follow them.

Weeds as Reservoirs of Virus Diseases

Many weeds and grasses are reservoirs of virus diseases that are transmitted to agricultural crops by insects. The study of plant virus diseases is a relatively new subject, but it has already shown that there are many important and destructive viruses that are extremely injurious to living plants most difficult to control. One very important method in dealing with these diseases is to destroy the intermediate plant hosts.

It seems very likely that these virus diseases originated in wild hosts and that they have been transmitted to cultivated plants by insects for ages. Fortunately not all insects are able to accomplish this transfer. In fact, only a relatively few groups now appear to be endowed with the capacity to act as intermediaries in taking a virus from one plant and transferring it to another. Certain aphids, leafhoppers, and a few thrips and beetles are capable of making the transfer. These carriers are generally omniverous

(Continued on Page 28)

(Left) Golf course in Alma, Michigan, two hours after treament with 2, 4-D. Note heavy growth of dandelions and wheel marks left by tractor and sprayer. *(Right)* Same golf course, 72 hours later, dandelions are dying. Note wheel marks are still visible.

Killing Woody Plants with Chemicals

by DR. L. W. MELANDER
U. S. Department of Agriculture

For almost thirty years, Dr. Melander has been studying, working and doing research on effective control of woody plants. He has his bachelor, master and doctor degrees from the University of Minnesota, with plant pathology as a major. Between 1920 and 1945, he was state leader of barberry eradication in connection with the stem rust control program in Minnesota for the USDA. Since 1945, Dr. Melander has been on the staff of the Field Headquarters office in Minneapolis in charge of nursery sanitation, barberry identification, and chemical eradication experimentation phases of the stem rust control project in eighteen states. In 1947, he was appointed chairman of the subcommittee on Research on Woody Plants for the North Central States Weed Control Conference.

A NEW ERA of brush control is made possible by the introduction of 2,4-D and other similar types of herbicides. It is an era that will probably see millions of acres of fertile range and crop land brought into productive use. It is the beginning of a phase of conservation that has remained undeveloped because of the prohibitive cost of the hand-labor methods of clearance. And that isn't all. Stubborn, persistent growth on right-of-way that present a perennial costly problem will go down under the attack of the chemicals. Useless woody plants that are now competing with valuable forest trees, and the alternate hosts of plant diseases, also will be eliminated by the new herbicides.

New Chemicals — New Machines

The urgent need for weed and brush control to conserve crop land during World War II furnished the impetus for the stepped-up herbicide development program. The discovery of 2,4 dichlorophenoxyacetic acid (2,4-D) was timely and it provided the answer for the long-awaited chemical that was highly toxic, inexpensive, versatile, selective, and harmless to man and animals. Weed and brush control that had been stymied by the exhorbitant costs of the only known chemical and hand-labor methods had the green light for the first time. The limiting factor was the time required to make the necessary tests to determine what plants were killed by 2,4-D, to check the efficiency of materials available, and to develop new spray equipment. The war-time development of power equipment for applying insecticides made possible the application of herbicides in this manner. Since the war, this phase of weed and brush control has made great advancement.

For the most part, the first research was confined to the use of 2,4-D for killing herbaceous weeds. Little attention was paid to the almost forgotten noxious woody plants, which in reality present a more formidable problem. The testing work needed is an enormous task and much time and many replications are necessary before sound recommendations can be made. Among the obstacles are the number of species of woody plants involved, and the fact that the chemical is selective in that it kills some plants and not others. This made its use in mixed stands impracticable. Woody plants by their very structure are not readily adaptable to the action of herbicides, and there previously had been little precedent established for work in this field.

2,4,5-T

A second chemical has recently come into use that may overcome some of the shortcomings of 2,4-D. This chemical, trichlorophenoxyacetic acid, commonly called 2,4,5-T, was formulated about the same time as 2,4-D. Recently it has been tested more thoroughly and found to kill some woody plant types not affected by 2,4-D. Raspberries and blackberries are sensitive to this chemical but tolerant of 2,4-D. This is a marked accomplishment because these two species are a serious nuisance in permanent pastures and other places. It appears that the 2,4,5-T will be used most extensively in combination with 2,4-D for woody plant eradication.

The Attack on Four Fronts

Woody plants are being attacked on four fronts: (1) alternate hosts of plant diseases; (2) range land and permanent pastures; (3) reforestation and forest management programs; and (4) rights-of-way.

The alternate-host eradication people pioneered in the field of chemical eradication of woody plants. More than twenty-five years ago the Federal and State Governments began tests to find a chemical suitable for the eradication of the barberry — the alternate host of stem rust of wheat, oats, barley, and rye, and currants and gooseberries — the host plants on which the destructive blister rust of white pine develops. No opportunity has been lost since that time to find a suitable chemical that would lower the cost of eradication. Both 2,4-D and 2,4,5-T have been found effective on certain species of these alternate hosts. Where they have been used on actual field work, costs of the eradication operations have been reduced materially.

On the western ranges there are an estimated hundred million acres of sagebrush-infested land. Ten million acres are covered with the sandsage (*Artemisia filifolia*). This latter species is sensitive to the action of 2,4-D and large areas are being successfully cleared with sprays applied by airplane. One pound of 2,4-D (acid equivalent) sprayed from air-

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planes at a total cost of $2.00 per acre effectively controlled this shrub. The elimination of sagebrush encourages the growth of forage and greatly increases the cattle-carrying capacity of the ranges. Since there are many millions of acres of sage-covered land, the potential prospects for improving the productivity of the western range areas by eradicating sagebrush are almost unlimited.

Many permanent pastures, especially in the Eastern States, have virtually been taken over by useless shrubs and trees. Facetiously referred to as "cattle gymnasiums," because of their inability to produce feed, these pastures are one of the greatest wastes of productive land in this country. Here again low-cost chemicals and application procedures will stimulate a new interest in pasture improvement and ultimately greatly increase forage production.

Reforestation and forest management stand to benefit much from the recent advances in woody-plant control. The maximum growth of young forest trees cannot be attained in competition with dense cover of useless shrubs and trees. Machinery and manual labor have been used for clearing in the past. It has been slow, tedious work, and the costs are high. Chemicals such as 2,4-D with selective action can speed up this work at reduced cost.

Rights-of-Way

Clearing woody plants from rights-of-way costs power companies, railroads, highway departments, and waterway owners millions of dollars every year. The use of the new chemicals and machinery is greatly reducing the cost of this operation and providing at least semi-permanent control. During 1948 thousands of acres of rights-of-way, especially along power lines, were sprayed with 2,4-D on a practical commercial basis, and a combination of 2,4-D and 2,4,5-T was used experimentally as a foliage spray. Sufficient time has not elapsed to thoroughly evaluate the results of these tests. However, a large-scale operator made this comment: ". . . We now feel that we can control all woody plants normally found in rights-of-way in western Pennsylvania by means of combinations of 2,4-D and 2,4,5-T esters, except the following: basswood, ash, and beech . . ." This statement obviously is optimistic, but it does provide some indication of the results obtained.

Methods of Killing Woody Plants

AN ideal herbicide for woody-plant control is a chemical or a combination of chemicals that will kill a large variety of plants. In addition, it must be inexpensive, readily available, easy to handle, and non-injurious to man and animals. Each new herbicide must run the gauntlet of complete and thorough testing. How should it be tested on woody plants? The objective is to have the chemical reach and kill the roots. The destruction of the leaves and other above-ground parts does not kill the roots of woody plants.

The following methods of application — every one or all of which may provide a route for the chemical to the roots — should be tried:

1. Apply chemicals to soil around plants, for absorption directly by the roots.
2. Spray the above-ground parts of the plants, either when they are in full foliage or dormant.
3. Apply chemical to wounds: i.e.,
   a. Holes bored in trunks of trees
   b. Gashes cut into trunks of trees
   c. Exposed cambium or ringing of trees.
   d. Cut surfaces of canes or stumps

Applying Chemicals on Soil Around the Base of Plants

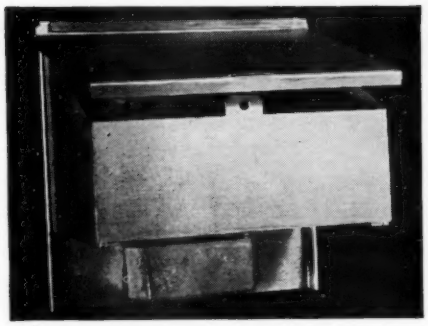
Some chemicals applied at the soil level around the crown of shrubs and trees give an effective "kill." Common salt has been used extensively this way to eradicate barberry bushes, and a salt-borax mixture has been used on gooseberry and currant eradication. For large-scale woody-plant eradication, their use is not practical. Sodium chlorate is very toxic when used in this manner, but the cost is prohibitive for large operations. This chemical also poses a fire hazard that makes its use undesirable. Sodium arsenite, ammonium sulfamate, et al., have been tried, but all of them have limitations that prevent practical use over wide areas. The application of 2,4-D to the soil around the base of woody plants has been found not to be an effective killing agent.

An intensive search is now being made for a formulation of 2,4-D, 2,4,5-T, or any other chemical that can be sprayed on woody plants at any season of the year and effect a "kill." Unfortunately, a "year-round" spray formulation has not been found. It is only during the actively growing season that it is practical to apply the spray.

Foliage Spraying

Spraying of foliage of species and varieties of woody plants that are readily killed with 2,4-D is a simple procedure, but there are certain factors that must be considered: (1) Foliage sprays are effective only if applied after the leaves are fully formed and young shoots have started; (2) Foliage sprays in general are not effective if applied after growth for the season has stopped; (3) The concentration of 2,4-D to be applied to woody plants is not less than 2,000 ppm., (two-tenths of one per cent); (4) If a combination of 2,4-D and 2,4,5-T is used, 1,500 ppm. (.15 per cent) of each chemical should be used in combination; and (5) It is not considered practical to attempt to kill large trees with foliage sprays.

One hears a great deal of discussion about the relative merits of the various formulations of 2,4-D: namely, the sodium salt, amine salt, and esters for woody-plant control. Amine salt and esters seem to give the best results. If the humidity is high in the areas where these two formulations are used, there likely would be very little difference between the effectiveness of either. However, if they are used in an area where the humidity is very low, esters would be the most effective. The main thing to consider in the preparation of spray material is that the concentration of the mixture be the desired strength. It should be kept in mind that woody



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plants are harder to kill and require higher concentrations than herbaceous plants. Therefore, care should be taken in the preparation of spray mixtures. It should also be kept in mind that in all foliage-spraying operations good results are dependent upon a thorough coverage of all aboveground parts of the plant.

At the symposium at the North-Central Weed-Control Conference, held at Springfield, Illinois, in December, 1948, there was considerable discussion as to which was more effective, straight oil or water solutions or water-oil emulsions. It seemed to be the consensus of opinion that the latter were the most effective.

Treating Wounded Surfaces

Boring holes or cutting gashes in tree trunks and inserting chemicals requires considerable labor, and a "kill" is very uncertain. Some degree of success has been attained by this method when ammonium sulfamate is used. This has not been tried extensively, and the available results are incomplete as well as inconclusive. Exposing the cambium or ringing and then treating involves considerable labor and does not effect a "kill" in a sufficient percentage of trees to warrant its use.

Treating the cut surfaces of stumps with chemicals immediately after the trees and shrubs are cut off provides an economical method of preventing sprouting. It is estimated that at least 60 per cent of the stumps are prevented from sprouting by this treatment. Therefore, much money can be saved in clearing rights-of-way and pasture land if the cut surfaces on the stumps are sprayed immediately after the cutting crews go through. Any equipment that will give a wet surface may be used to apply the chemical. There are two chemicals that may be used for this type of treatment: Dry ammonium sulfamate salt (amate), when applied to cut surfaces, will not only prevent sprouting in a high percentage of cases, but also expedites the rotting and disintegration of the stumps. An ester of 2,4-D in kerosene or distillate (not less than 5 per cent) applied to both the cut surfaces and the sides of the stumps is somewhat simpler to apply, but it does not expedite the rotting and disintegration of the stumps. There is a possibility that a combination of not less than 5 per cent of 2,4-D and the same amount of 2,4,5-T in kerosene or distillate might be more effective for preventing sprouting than 2,4-D alone. Sufficient time has not elapsed to obtain results from which recommendations can be made.

Need for Caution

Recommendations for the use of 2,4-D and 2,4,5-T should carry words of caution. *Herbicides of the type of these two chemicals should not be used near crop plants that can be injured.* Garden crops such as tomatoes are very sensitive to 2,4-D. Many garden flowers also may be damaged. Likewise, these chemicals should not be stored in places where fumes may have an adverse effect on tubers, bulbs, and even seed.

Obviously, substantial progress has been made in recent years in the development of chemicals and machines for controlling woody plants. We can be optimistic that the future holds even greater developments in store. There is little doubt but that methods will be simplified and costs reduced. The limitation of our present knowledge, however, requires that we proceed slowly and carefully with large-scale operations. Certainly, before any large areas of mixed stands of woody plants are treated with growth-regulating types of chemicals, preliminary tests should be made to determine whether best results can be had with 2,4-D, 2,4,5-T, or a combination of both.[1]

1. The latest information on reaction of woody plants to 2,4-D and 2,4,5-T is contained in the 1948 Report of the Research Committee of the North-Central Weed-Control Conference.

New Horizons for PCOs

BY PAUL HERBERT

STRINGENT enforcement by the Chicago Board of Health of sanitation regulations applying to public eating and drinking places has brought an unexpected windfall of new business to one pest control operator in that city. The new enforcement policy was adopted by municipal authorities following release of a federal Public Health Service survey which revealed widespread unsanitary conditions in the city's restaurants, cafes and taverns.

When word got around that one restaurant had been ordered to close down some of its equipment because of contamination by the dangerous colon bacillus, another restaurant man determined that wouldn't happen to him. With the help of a leading Chicago PCO firm, he's making good on his resolution.

As related by the operator, who requested that no names be used, the restaurateur consulted with him on the problem of curbing the germs, as well as insects in kitchens and pantries in the man's chain of eating places regularly serviced by the operator.

A system was set up for making swab tests at frequent intervals from glassware and other utensils. Then, after laboratory examination, correctional measures, if indicated, are applied to the chemical formulations used in the dishwashing machines, while a thorough cleaning schedule is put into effect.

Recently this entirely new feature of the business has been extended to drug and dime store fountains and to taverns, where ice making machines as well as glassware and utensils are kept under constant watch.

"The big worry of all these people," said this PCO, "has been that an inspector will arrive unexpectedly and discover some temporary contamination. The food and beverage folks don't knowingly tolerate unsanitary conditions and our new service seems to be bringing all customers great peace of mind. When the health boys from the city hall show up, our clients

(Continued on Page 26)

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THE MEDICAL problems associated with the use of the synthetic pesticidal agents recently introduced are not new. The same basic problems of food contamination, water pollution and occupational hazards exist with the newer economic poisons as have existed with the older pesticides. However, the lack of essential information on the newer poisons coupled with their over-enthusiastic acceptance by the general public has caused grave concern in government and medical circles and among some manufacturers. The education of the public in the safe and sane use of pesticides is of paramount importance. In this field pest control operators can make a real contribution.

To this end then, I should like to point out the potential health hazards that exist, the economic problems which have been created by these new poisons, and the approach the medical profession is undertaking to aid in the prevention of accidents.

Food Contamination

Food contamination from pesticides may arise from several sources.

1. Toxicants may be incorporated into plant tissue during the process of growth. This penetration may arise from surface residues at the point of application or from soil deposits which are absorbed by the roots and tubers of the plant. Recent work at state agricultural experimental stations indicates that several of the newer agents, including DDT, benzene hexachloride and parathion may be absorbed by certain fruits and vegetables from surface and soil applications (1).

2. Economic poisons may accumulate in animal tissues from which foods such as meat, eggs, butter and milk are obtained. Studies at the Food and Drug Administration have shown that animals, even at low dietary levels of intake, may store appreciable amounts of DDT in tissue fat. The presence of even small amounts of this agent in forage crops assumes the same importance as relatively larger amounts on fruits and vegetables consumed by man (2).

3. Food may be accidentally contaminated as the result of careless application of sprays and fumigants in food processing plants and in the home, or through mistaking the poison for some food commodity. Several cases of poisoning have resulted from DDT being mistakenly used for flour which was made into bread (3&4).

4. Lastly, food may be contaminated from containers on which these materials have been used. For example, lug boxes sprayed with from one-half to five per cent DDT transmitted this agent to raisins stored in them in amounts up to 5 p.p.m. (1).

There are many other sources of possible food contamination but these few examples serve to indicate the seriousness of the problem. The over-enthusiastic application and indiscriminate use of pesticides without regard to possible consequences can only lead to disaster.

Water Pollution

Pollution of water supplies may also arise from the unwise use of pesticides. Instances of contamination of ground and surface waters have already been reported in Southern California. (5).

1. In the first instance, chlorophenol in a concentration of 1-2 parts per billion made water unpotable.

2. In the second instance, the contamination of a city's water supply with a herbicide has almost become a classic. In this case, a small amount of 2,4-D was carelessly discarded into the sewage system of Pasadena, California. It passed through the sewage treatment plant into a drainage canal. Seven days later the water wells of the city of Monticello, California were made unpotable. It took elaborate and expensive procedures plus many months of treatment before the water again became drinkable.

This points up the problem of the widespread use of 2,4-D as a weed killer along the banks of streams or anywhere with respect to ground water.

3. Other instances have been reported where these economic poisons have caused difficulty through increase in mineralization of waters. For example, in Orange County, California, the mineralization is so high that the water is not suitable for certain uses.

To conclude the subject of water pollution, the problem of highly potent and rapid acting agents being leached out of the soil into ground waters has been posed. For example, precautions have been advanced for the rodenticide, Sodium Fluoroacetate, relative to its use in bait in circumstances where it could be washed out of baits by rain and subsequently contaminating farm well-water.

An illustrative case of what might happen on a mass scale is the following incident which was reported by a District Office of the United States Public Health Service (6). Recently a health official and his sanitarian in a mid-west community planned on a rat control program. Full page ads appeared in the local paper announcing that every business establishment would be given a gallon of 1080 to use. The Public Health Service was wired for supplies of the agent, since distribution is restricted. As a result, representatives of the Public Health Service investigated the situation and pointed out the dan-

CIATION *is Interested in the* PESTICIDE PROBLEM

By

BERNARD E. CONLEY, R. Ph.

Administrative Assistant, Council on Pharmacy and Chemistry

American Medical Association

gers inherent in such a program. Here was an instance fraught with the most dangerous consequences. It emphasizes the lack of information on the part of individuals who should be familiar with the hazardous properties of these agents.

Occupational Hazards

The next reservoir of potential hazards to the public welfare lies in occupational hazards connected with the use of these new poisons. These occupation hazards may be classified into three groups depending on the capacity of the users — namely: industrial workers, agricultural workers and domestic users. Examples of adverse reactions to individual agents follows:

I. *Industrial Hazards* exist where the individual is exposed to the agent in the course of his work routine. Many factors, other than the toxicity of the basic ingredient, enter into the evaluation of the industrial hazard. For example, such factors as (a) the toxicity of the vehicle or carrier for the toxicant, (b) the existence of additive and potentiating activity of the solvent on the solute, (c) particle size in the case of aerosols, and (d) the route by which toxic quantities might be encountered such as by ingestion, inhalation or skin contact. Individual susceptibility is also an important factor as can be seen by the many contradictory reports about poisoning from DDT.

A. The organic phosphate compounds, hexaethyl tetraphosphate, tetraethyl pyrophosphate and parathion, are among the more dangerous of the newer insecticides as far as industrial users are concerned. As a group, they are extremely toxic and rapid in their action. Special precautions should be observed in handling the concentrated materials to avoid contact with the skin and inhalation of the dust. A small amount of tetraethyl pyrophosphate splashed into the eyes causes temporary blindness and may prove fatal if not immediately washed out.

Airplane pilots involved in crop-dusting have experienced real difficulty with these compounds. The dusts are blown back on the pilots during the loading operation. It has been reported that one pilot has been lost, the cause allegedly being due to TEPP (tetraethyl pyrophosphate); other pilots have reported a peculiar effect on their vision as the result of these operations. (5).

B. Methyl bromide was found to be the cause of inebriation about the date packers in the Coachella Valley of California. The cause was not investigated until two workers were hospitalized for mental symptoms. (5).

C. Ethylene Chlorohydrin, which is used to accelerate dormancy period for the sprouting of potatoes, caused the death of one individual and caused several others to become seriously ill. This agent had been used for two years and workers experienced mild transitory symptoms while handling it; however, no precautions were taken until this accident occurred (5, 6).

D. Sodium Fluoroacetate poisoning has also been reported. In this instance, a small amount of this highly toxic and rapidly fatal rodenticide was blown into the operator's face. Fortunately the individual survived and as a result we have a personal record of the sensation of poisoning from this compound. (15).

These and other cases of poisoning emphasize the need for precaution and a full knowledge of their dangerous properties by individuals who must work with these materials. In the last several years over 200 cases of poisoning from these sources were reported by one state health department alone (5, 6).

II *Agricultural Hazards* parallel those from industrial sources and the reports of poisoning oftentimes do not make a distinction between the two. In most instances, however, the danger lies in the use of spray materials. The following instances have been reported:

1. Benzene Hexachloride — Some individuals have experienced nausea, headache, and irritation of exposed body surfaces to dusts during field application. Refusal to work with this material by these individuals has been noted (7).

2. Parathion — Operators using this material for grasshopper control were very sensitive to even the slightest amount of drift from this material. An objectionable (onion-like) odor and irritation of the mucous surfaces of the eyes and throat were observed. Subsequent exposures to the dust reduced sensitivity (8). However, later studies found that the serum cholinesterase of individuals exposed to parathion, in spraying operations for one day, was reduced 30%. The significance of this finding lies in the fact that the blood level of this enzyme is an index to the onset of severe nervous disorders resulting from overstimulation of the parasympathetic nervous system. Although demonstrable symptoms would not appear until the level was reduced

60%, repeated and continued exposure may lead to this or greater reductions in the cholinesterase level of the blood (6).

3. HETP (Hexaethyl Tetraphosphate) — Humans exposed to this compound during spraying operations often complained of shortness of the breath and a sense of constriction of the chest (9). It is chemically related to parathion and similar dangers exist with its use.

4. 2,4-D — Hypersensitivity to phenol compounds is not uncommon. Some individuals have found this material disagreeable and necessary to discontinue its use after a few days (10).

5. Xanthone — Produced severe dermatitis in spray operators and pickers. In one crew of 750 men, 150 were incapacitated and 8 hospitalized (1).

Very little information is available concerning the problem of variation in susceptibility of individuals to the various compounds. Considerable caution should be exercised by agricultural workers in the application of the newer poisons until more is known about their toxic potentialities under the circumstances of ordinary use.

III. *Domestic Health Hazards* — A variety of conflicting reports of human poisoning from the domestic use of these newer pesticides are available. As often as not, the solvents used as the vehicle for the insecticidal agent are the cutaneous irritants or systemic intoxicants. However, several of the reported instances were the direct result of misapplication and the apparent disregard for the inherent toxic properties of these compounds.

The first case that comes to mind is the report (5) of a nearly fatal poisoning of a boy who was exposed to a tetraethyl pyrophosphate spray. This spray was used by the boy's father to rid the area under the front porch of houseflies and mosquitoes. Later, the son stood near the porch and practiced rifle-shooting. He became suddenly ill and displayed typical symptoms of poisoning from this material, including loss of sight and partial paralysis of the extremities.

An interesting type of domestic poisoning was recently described in the *Journal of the American Medical Association*. A Southern physician reported the convulsive death of a child who lived next door to an insecticide mixing plant. The exhaust fans of the plant discharge a mixture containing benzene hexachloride. To support his contention that the cause of death was due to this agent, the physician placed rabbits in the plant and exposed them to the dust lost in the normal working process. All died during the second week of exposure (11).

This is not the first report of concern over this type of thing. As early as a year ago public health officials in the state of Washington held a conference on the possible hazards caused by the drift of agricultural sprays outside of orchards, particularly where applications were made in the vicinity of dwellings (12).

Economic Problems

Certain aspects of the economic problems presented by the newer pesticides have bearing on the health and welfare of the public. These will be considered in the light of their medical significance.

I. *Residue Problems* — Medical interest in residues is principally concerned with food contamination. The inclusion of chemicals of unknown toxicity in substances for human consumption is fraught with considerable danger. Therefore, the various physical and biological factors involved in the residue problem will be reviewed in the light of their influence on the total problem.

1. *Stability* in a pesticide is not an unmixed blessing. When used for certain types of spraying operations, stability of a chemical in the presence of the elements is a decided advantage. However, the adherence of residues to food crops presents some decided disadvantages, particularly so if the contaminant cannot be removed by customary washing and scrubbing procedures. Fruits and vegetables which have been refused by food processors because of heavy contamination or tenacious residues may be directed to the wholesale produce market for ultimate distribution to the consumer. If food processors have difficulty in removing these residues, it is unlikely that the housewife will be more successful.

2. *Accumulation* of residues in plant and animal tissue also has dangerous implications. Soil deposits of pesticides may be absorbed and accumulated in sufficient amounts that repeated consumption of the food provides harmful amounts of toxicant. This is aptly illustrated by the accumulation of DDT in animal fat and milk, the latter of which is the main constituent in the diet of infants.

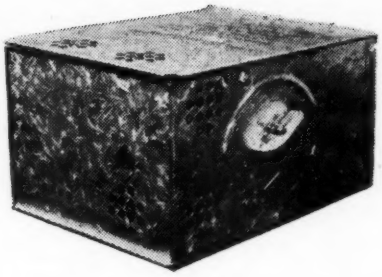
3. *Penetration* and translocation of residues in tissues present similar problems. In the first instance, the problems of residue removal are multiplied many times by the penetration of the poison. For example, DDT penetrates the wax coating surface oil vesicles of fruits and vegetables. When certain portions of the plant are used for food purposes, such as citrus rind in the manufacture of marmalade, the complete removal of residue is impossible (13).

Translocation of residues within the plant tissue presents an entirely different set of problems. In this instance the residues may be translocated to the edible portions of the plant. Its consequences are apparent.

II. *Detection and Decontamination Problems* — Analytical methods for the detection of chemical contaminants of crops, processed foods and soil are developing faster than removal procedures. But, this is understandable in the light of the inherent differences in the situations encountered. In the absence of satisfactory chemical methods for detecting residues, biologic methods have been developed utilizing insects and indicator crops which have a known and marked sensitivity to the pesticide. Decontamination procedures are still in primitive stages for many agents. For example:

1. DDT — Surface residues on some crops may be removed with detergent washes and high temperature treatment to dissolve wax coatings, or by steam peeling methods. However, certain fruits cannot be subjected to hard washing and high temper-

Curiosity Catches The Mouse



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M·S·A HCN GAS MASK

Protects against HCN concentrations wherever enough air is present to support life. Long-lasting, replaceable canisters.

M·S·A DUST RESPIRATOR

Popular M.S.A. Comfo and Dustfoe models provide ALL-DUST breathing protection, with inexpensive throwaway filters.

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Keep gases, mists and irritating dusts out of eyes. Non-fogging water chamber design.

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When rubbed on the skin, provide protective barrier against irritants. Easily washed off after work.

M·S·A FIRST AID KITS

Unit-packaged first aid treatments, ready for instant use. Dust and moisture-proof steel cases.

Write for descriptive Bulletins on these outstanding M·S·A Products!

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PITTSBURGH 8, PENNSYLVANIA
District Representatives in Principal Cities

ature without damage. In these instances, food processors have rejected the commodity which shows even traces of contamination. Satisfactory methods for vegetables have not been developed.

2. BHC — Practical methods for decontamination have not been developed to date. Extremely small amounts of this material can be detected in fresh and processed foods because of the objectionable odor which is imparted to the products.

3. Parathion — Preliminary research on processing breakdown of this pesticide indicates that it is only partly decomposed in processing.

III. *Food Processing Problems.* These are of a medico-economic nature since the general level of public health is reflected in the type and quality of food which it consumes. Fear has been expressed that we know too little about the influence the newer poisons may have on our foods. This fear has been created because of past experience with the older agents and some fragmentary information about the effects of some of the newer materials.

1. Odor and flavor changes — Benzene hexachloride apparently penetrates the tissues of fruit and vegetables imparting an objectionable odor and flavor to either the fresh or processed food. A strong musty odor is imparted to eggs from henhouses which have been sprayed with this material which is not changed by either boiling or frying the eggs (14).

2. Appearance — It has been found that DDT may delay the maturity of potatoes resulting in a thin skinned vegetable which is easily injured during digging, grading and shipping. This results in deterioration of quality to the disadvantage of everyone. Beans grown in soil previously treated with 2,4-D were characterized by a mottled discoloration (1).

3. Nutritional value — Many things modify this factor in foods. Little is known of the influence of the synthetic organic materials or nutritive value. However, an older material, lead arsenate, is banned in Florida because it greatly reduces the Vitamin C content of citrus crops. Recent investigations with the weed-killer 2,4-D suggest the possibility that this compound may induce metabolic changes in the ripening wheat kernel leading to a higher ratio of protein to starch.

Medical Profession's Interest in the Problem was crystallized last November when a Conference on the Health Hazards of Pesticides was held at the headquarters offices of the American Medical Association in Chicago. The conference was called primarily to assess the health hazards created by the newer economic poisons and to exchange ideas and information relative to public health problems they have created. About forty individuals attended this meeting representing government agencies, academic centers, trade associations, manufacturers, toxicological laboratories and state public health departments.

A Joint Committee on Pesticides was proposed which would serve to coordinate the medical activities interested in the problem and guide the practicing physician in the problems which these new agents have presented. The contemplated functions of this committee may be briefly summarized as follows: (a) establish safe standards for use, (b) foster development of prophylactic and antidotal measures, (c) stimulate voluntary control, (d) contribute to the standardization of nomenclature, (e) accumulate and evaluate new information bearing on the health aspects of the problem and (f) undertake an intensive educational program on the health benefits derived from the wise use and the health hazards inherent in the misuse of pesticides. Work on several of these projects has already begun. These initial efforts will be be expanded and intensified when the Joint Committee becomes activitated. However, to carry them out will require the support and cooperation of all segments of science and industry. Advisory bodies from the various interested groups will be called upon for recommendations and suggestions no problems which fall within their field. In turn, the assistance and support of this committee will be available not only to the medical profession but to all other groups in any direction in which it may be useful.

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USDA Bulletin on 2,4-D

"Using 2,4-D Safely" is the title of a new Farmers Bulletin published recently by the U. S. Department of Agriculture. It was written by L. S. Evans, agronomist, J. W. Mitchell, physiologist, and Ray W. Heinen, information specialist.

The publication, which is F.B. 2005, describes in detail the various methods to be used in following these rules, and explains the different forms of 2,4-D and their effects on different crops.

It's Here

THE NEW AND IMPROVED

EESSCO Saf-T-Cup

Offered at lower prices because the NEW EESSCO Facilities permit Mass Production — you pay less by purchasing direct from the manufacturer.

The EESSCO Saf-T-Cup was the best that could be made . . . but after receiving many comments from the National Pest Control Association, U.S. Department of Interior, City and Governmental Health Agencies and PCOs who have used the EESSCO Saf-T-Cup, we have now developed a better cup that will meet with everyone's approval. This cup is not the usual improvised product which the PCO has learned to accept whenever he needs anything, but a product developed and manufactured especially for the PCO — the result of intense research and development.

NEW LOW PRICES!
Special Sample Offer!
250 Saf-T-Cups — Sent for Only $1.00

5M	$2.50 per M
10M to 20M	2.25 per M
25M or more	2.15 per M

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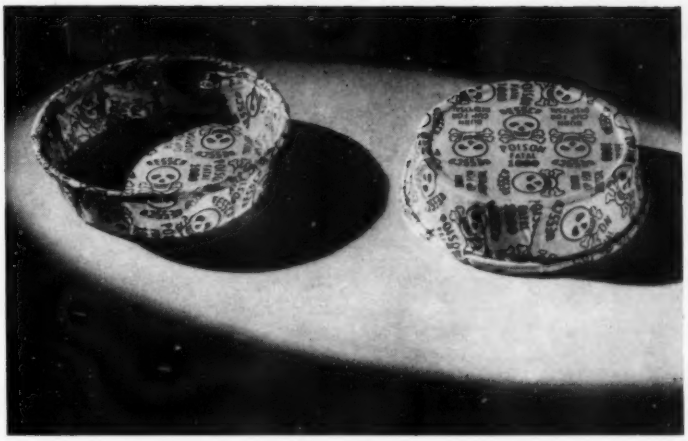

- Has wide crimp which makes cup absolutely leak-proof. Not low sharp crimp which caused leaks
- Has triple fold lip which keeps cup in shape until liquid completely evaporates.. Not single fold lip which made cup shrivel after 24 hours.
- All sides of cup carry printing and can be used for colored liquid and solid baits of all kinds. Previously solid baits or colored liquids covered Poison Legend.
- ¾ oz. size is recommended for maximum safety. 1 oz. size is considered dangerous for many uses.
- Comes in new, hard pasteboard, handy-dispenser box. Keeps box until all cups have been used. Old box wasted many cups by crushing and spillage.

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5 times as fast... with the versatile Kennadrill

*This edge means EASE, SPEED in TILE, BRICK, CEMENT, LIMESTONE, SLATE, PLASTER, STONE, WALL BOARD, etc. The Kennametal (cemented carbide) cutting edge resists abrasion, has diamond-like hardness, and it stays sharp up to 100 times longer than steel.

The Kennadrill is a big cost reducer, a smooth, easy worker in any nonmetallic construction material you tackle. The sharp, hard point pierces smooth surfaces, drills clean, true, sharp edged holes.

Ejecting action of the blade "kicks" cuttings back so you go deeper and deeper without feeling the drill bind or stall. The shank is round so there are no flutes to pile up small cuttings and stop or twist the drill.

Progressive, cost-conscious pest control operators praise the Kennadrill for the way it minimizes man-hours . . . takes the high cost and drudgery out of masonry drilling. J. L. Purdy, Hamilton, Ohio, says, "This is really something. Over four hundred inches of cement. The point of the cutting edge shows no sign of wear, absolutely none. Please send me . . ." Bit sizes are from ¼" to 1½" and they are used in rotary drills. Get all the particulars. Write for folder PCK now.

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FOR YOUR INFORMATION

Making mortality counts on insects.

NIFOS-T DEADLY to wide variety of insects

Leaves no toxic residue

The past two seasons have demonstrated the usefulness of Nifos*-T (Monsanto Tetraethyl Pyrophosphate) for controling many pests that plague greenhouses, orchards and truck farms.

Here are some proved uses:

- ✔ Protection of greenhouse crops from aphids, mites, mealybugs and whitefly.
- ✔ Aphid control for canning and quick-freeze vegetable crops, such as peas, spinach, beans, cabbage and broccoli . . . Canners are recommending its use to their growers.
- ✔ Protection of shade and field-grown tobacco from aphid attack.
- ✔ Control of the periodical cicada (17-year locust) in young orchards.

Proved effectiveness—plus the fact that Nifos-T causes no problems of residual toxicity — is giving the product ever-expanding applications involving agricultural and horticultural pests.

SEND FOR LITERATURE

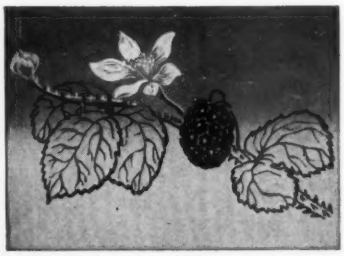
For more complete information ask for copies of Monsanto Technical Bulletin No. O-46, "Nifos-T," and a recent Monsanto study, "Determination of Tetraethyl Pyrophosphate in Mixtures of Ethyl Phosphate."

PROGRESS REPORT ON NIRAN

Monsanto's Parathion effective against greenhouse pests

Recent Government and University research has shown that Parathion (Monsanto's Niran*) gives excellent control of insect pests that attack greenhouse ornamentals.

Monsanto is producing limited amounts of Niran in 1949 for formulation by insecticide manufacturers.



FOR CONTROL OF WOODY WEEDS

2,4,5-T Acid
2,4,5-T Isopropyl Ester

Field experiments indicate that formulations of 2,4,5-T are highly effective in controlling woody weeds that are resistant to other herbicides.

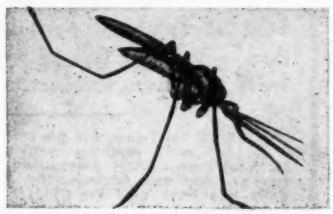
Monsanto 2,4,5-T Acid and 2,4,5-T Isopropyl Ester are now available in moderate quantities . . . Inquiries are invited concerning properties and applications.

DILUENT FOR DDT

Latest data on SANTOCEL C

A recent bulletin of the U. S. Department of Agriculture, "Storage Tests on Conditioned and Wettable Powders Containing 90 Percent of DDT," is now available in reprint form from Monsanto.

The publication contains useful data on silica aerogel (Monsanto's Santocel* C) as a diluent for DDT formulations . . . Address requests for copies to MONSANTO CHEMICAL COMPANY, Merrimac Division, Boston 49, Mass.



1,500 SPECIES OF MOSQUITOES

Santobane an effective weapon

There are about 1,500 known species of mosquitoes in the world. However, their ranks are being depleted through intensive application of Santobane (Monsanto DDT) formulations.

In addition to its wide domestic use, Santobane is employed to combat malaria-carrying mosquitoes in tropical regions throughout the world.

EMULSIFIER FOR 2,4-D

Sterox SK recommended for use with 2,4-D Isopropyl Ester

Polyoxyethylene Thioether is efficient over wide ranges of pH and heat

Formulators of herbicides will find in Sterox* SK an excellent emulsifying agent for 2,4-D Isopropyl Ester. A product of Monsanto's Phosphate Division, Sterox SK is a clear, amber-colored polyoxyethylene thioether which contains no alkali. It is stable over a wide range of pH and heat—is equally efficient in solutions that are hot or cold, hard or soft, acid or alkaline.

Only small concentrations needed

Sterox SK is supplied in highly concentrated form, with the result that only about a 4% concentration is needed with 2,4-D Isopropyl Ester. This advantage, along with favorable prices, makes Sterox SK most economical to use.

Further details may be obtained by writing MONSANTO CHEMICAL COMPANY, Phosphate Division, or by noting your request on the coupon.

News of Monsanto Chemicals for Agriculture . . . April, 1949

SANTOBANE NOW AVAILABLE IN THREE FORMS

Monsanto Santobane* is now furnished in three forms, all made to the highest standards of effectiveness and uniformity:

SANTOBANE

A high-quality, fine granular powder. Readily solubilized, emulsified or milled.

SANTOBANE 50

A straight dust concentrate containing excellent inerts. Free-flowing for air or ground dusting.

SANTOBANE 50W

An improved wettable form of Santobane 50. Contains a superior wetting agent permitting its addition direct to water to form a non-foaming fine suspension.

Send for 28-page Santobane book

Complete information on Santobane is contained in a 28-page illustrated book, "SANTOBANE, Monsanto DDT." Send for your copy.

ORTHODICHLOROBENZENE widely used for forest insect control

Effective against mountain pine beetle

Last summer 110,000 trees on one million acres of western forest land were threatened with an epidemic attack of the mountain pine beetle. As a countermeasure, standing trees were sprayed with a mixture of orthodichlorobenzene in fuel oil, to penetrate the bark and kill mature beetles before emergence. Five hundred men participated in the campaign, which lasted from May 1 until the latter part of July.

Further information on orthodichlorobenzene and its many important applications will be sent promptly on request.

Now available in five-gallon containers

As a service to small-volume consumers, Monsanto is now packaging orthodichlorobenzene in quantities as small as five gallons.

2,4-D helps cut small grain losses due to stem rust disease

Useful in eradicating rust-susceptible barberries

"The stem rust disease of wheat, oats, barley and rye is one of the most destructive of all the fungus diseases that attack small grains. Every year it reduces the yield and quality of these crops in some areas. In epidemic years it has caused losses in the United States of more than 180,000,000 bushels of grain."**

Monsanto 2,4-D Acid will help reduce these losses when properly used to destroy rust-susceptible barberries. It is recommended that barberry canes be cut off at the crown and that these freshly cut surfaces be treated with small amounts of 2,4-D in concentrated form. As a safety precaution, *only experienced persons should use this method.*

The destruction of barberry bushes eliminates early-spring sources of stem rust inoculum and eradicates the plants on which races of the fungus breed. There are many species and varieties of barberries. Most of them are susceptible to stem rust, but a few are immune or highly resistant . . . In addition to properly applying 2,4-D, farmers should use approved rust-resistant varieties of grain — follow cultural practices recommended by state experiment stations.

Monsanto furnishes 2,4-D in these three forms:

2,4-D Acid (99% minimum assay)
2,4-D Sodium Salt (minimum 82% equivalent 2,4-D acid)
2,4-D Isopropyl Ester (99% minimum assay)

Inquiries concerning technical data, prices and availability will be given prompt attention.

**Quoted from "Stem Rust," Picture Sheet No. 23, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. Copies available at five cents each from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

WATCH THE WIND

When burning 2,4-D containers

We have recommended from time to time careful disposal of 2,4-D containers to avoid accidental contamination . . . Paper, fibre or wood containers should be burned so that they cannot be used for other products. If containers are burned, however, care must be taken that wind drift of volatilized 2,4-D is not permitted to contact growing crops.

*Reg U. S. Pat. Off.

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New Horizons For PCOs

(from page 16)

have our independent and unbiased reports to back them up and there isn't any argument about it."

This progressive incident came to light during an investigation to learn what the industry is doing in Chicago to broaden its activities above and beyond the traditional operation of insect and rodent control. The search revealed that unlimited opportunities exist for building business in new fields, provided alert operators keep up with and follow through on current scientific developments. Growing recognition of the importance of public sanitation also spells more business for the PCO, the inquiry established.

DDT may be an old story, but all its chapters have not been written yet. As every operator knows, its advent for killing flies and mosquitoes opened up tremendously important new outlets for pest control work, and these possibilities are not yet exhausted.

One firm reported that last year it handled between 2,000 and 3,000 fly killing jobs. Restaurant owners, whose fly problem was settled for the full season by just one treatment of walls and ceilings, consider that the chemical gives them a definite competitive advantage over the place across the way which hasn't caught up with the procession. While flies have more recently shown some resistance to DDT, other chemicals still make fly control profitable.

This operator said he also gives fly proofing service to such varied premises as taverns, night clubs, and theatres, bakeries, grocery, drug and dime stores, many of which are regular users of the company's rodent and vermin extermination service.

Amusement parks and outdoor sports arenas are also being made more enjoyable for patrons by DDT spraying to kill mosquitoes. Power sprayers are commonly employed and one newly organized Chicago company is using the aerosol fogging method for this mosquito control work.

Moth Proofing Profitable

Moth proofing has become an important feature of the pest control business. Viewing the unlimited field here, one man unselfishly asserted that "More operators ought to get in on this." He, himself, has developed a large and growing business among occupants of high rental apartments along Chicago's exclusive lake front "Gold Coast." Rugs, tapestries, upholstered furniture and even fancy needlework are treated and this business is proving quite profitable.

Flame proofing, too, has strong appeal to property owners and several Chicago PCOs have organized special departments to capitalize on the increasing interest in this development.

Weed Control

Weed control is another field offering possibilities for considerable expansion. Publicity given the use of 2,4-D for killing farm weeds has made urban property owners aware of this chemical's potentialities around their places and one Chicago firm is reported to have built a flattering business in this direction. Managers of country clubs and amusement parks are also said to be showing interest in this easy and comparatively inexpensive means for keeping all corners tidy.

These various projects, it is pointed out, involve the use of chemicals and since PCOs have the know how for handling such compounds, the addition of services such as mentioned, seems a natural for the industry. It is significant that what has been suggested is not something theoretical, to be done, "maybe, in the future." It's being done now and the large volume of experience accumulated indicates that this work is practical and profitable.

One thing the Chicago survey indicated is that the industry there is, in general, not deeply interested in adding rest room sanitation services to its operations. Large wholesale distributors of sanitary supplies in the Chicago area have gone into this type of service because, obviously, it definitely helps sell more of the sanitary products in which they are primarily interested.

Pest control operators, however, point out that such a service requires a lower grade of employees than their regular staffs, many of whom are college graduates who, naturally, do not care for the job of cleaning up such places. If rest room sanitation service is added to any firm's activities, it might require a special organization and, at present, there seems to be little interest around Chicago in such a step.

Public Laundries

Asked if there is opportunity for the pest control man in the public automatic laundries that have appeared by the score in Chicago and elsewhere, one man said he doubted it. Hot water and soap take care of most germs but the fungus causing "athlete's foot" is said to be giving some difficulty. There might be opportunity here, it was suggested, for a PCO to sell the laundry management on the idea of using appropriate fungicides. Only a spoonful is required in each wash, but continuous use of the washers around the clock, day after day, would call for sale of considerable quantities.

Retail Sales

This led to an inquiry as to the industry's attitude on the idea of carrying a line of packaged sanitation products, such as roach powder and rat poison, for retail sale to householders. Many Chicago PCOs are doing just that, it was learned, and one large operator is featuring household sprayers.

One operator reported that he is frequently called in for consultation by persons who are erecting new buildings and want to be sure the termites won't undo the job. More particularly, they are anxious to comply with Chicago's new ordinance requiring the rat proofing of all new construction and ask the experienced operator to check over blue prints to make certain that the architect has everything right.

Chicago pest control operators, it was learned, are following closely the subject of glycol treatment of office space, churches and other public halls where crowds assemble.

TRANSPARENT PLASTIC
—SPECIMEN BOXES—

For keeping insects and other specimens in orderly arrangement, for quick reference.

These transparent boxes protect specimens, both before and after identification. They enable you to build up a valuable permanent collection of specimens for future reference.

THREE SIZES (Outside Dimensions)	PRICES
A: 15/16" x 15/16" x 3/4"	A: 20 for $1.00; 100 for $4.60
B: 1 7/8" x 15/16" x 3/4"	B: 15 for $1.00; 100 for $5.60
C: 1 7/8" x 1 7/8" x 3/4"	C: 12 for $1.00; 100 for $6.60

ASSORTMENTS
No. 1: 8A, 4B, 4C $1.00
No. 2: 60A, 20B, 16C $5.00

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TERMITE CONTROL WORK

BONDED TERMITE TERMITOL INSULATION

Large termite jobs usually involve structural changes and major replacements. They require the "know-how" of construction engineers and skilled craftsmen — carpenters and masons, plus termite control experience.

We are equipped to handle any intricate job entailing major construction work on a profit sharing arrangement. We furnish large experienced crews together with all necessary tools and equipment PLUS specially built chemical treating equipment for wood impregnation.

TERMITOL enjoys a strong financial position with an excellent record of having successfully treated hundreds of large structures for many renowned firms and organizations.

WHEN FIGURING ON A LARGE JOB, COMMUNICATE WITH US.

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Spread and Power

Effective pest control requires wide spread of insecticide and the driving power to force it into every crack and crevice—under mouldings, behind baseboards, around plumbing, between cases and bales.

MISTMASTER Ball Bearing Fan Type Sprayers have both the spread and the power to do a quick, thorough job. Driven by 1/3, 3/5, or 1 hp. motors, they spray insecticides for distances as far as 40 feet, penetrate into hard-to-reach places, and spray large areas quickly, completely.

Here is a sprayer that has more power than any other portable sprayer, yet is convenient and easy to handle. Equipped with 1-gallon non-corrosive tank, driven under low pressure with a high volume of air, it can be used with any type of insecticide, either oil base or water base, and carries insecticides into remote openings in full volume and power.

Used anywhere, it plugs into any electric outlet, and is supplied with three nozzles for fine, medium, or coarse spray, can also be furnished with 2-gallon tank and special nozzles or in special design to meet individual requirements.

WRITE TODAY for further details and complete specifications or mail the coupon.

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PCO NOTEBOOK

by

J. R. Gross

INCINERATOR VERMINOPOLIS

An incinerator often develops into heat-plant, grocery store, cafeteria and social center for some of the toughest infestations.

Thousands of apartments, buildings and homes operate old-fashioned units in just the right sloppy way to encourage almost every kind of pest.

In these ancient, outdated installations, it is next to impossible to keep the garbage completely destroyed. Addition of gas burners is a big help, but even so, the garbage usually keeps piling up all day before it is burned. This gives the vermin plenty of time for feeding. When the fire is started, there is quite a scramble for safety. Some get caught in the flames and add to the food supply of their cannibalistic friends.

In the hollow tile and concrete block walls adjoining the incinerator are conditions that are just right for Oriental roaches, mice, silver fish, larder beetles, buffalo beetles, ants, rats and others. Safe in the inaccessible, quiet seclusion, each species can find the perfect requirements for its harborage. Perfect, that is, when the way is open to and from the incinerator super market.

Most common are the Oriental roaches. The unseen populations they can develop in several years is almost unbelievable to those who have never experienced it. Mice and firebrats probably rate next in frequency, while the total list just about covers the complete roster of who's who in household pests.

Once the incinerator shell ages, cracks develop between the bricks, and the door is opened into a highway network that reaches every remote cranny of the building. Small cracks admit insects; larger ones admit mice, and sometimes even rats find an open gate to the secret passage ways of Incinerator Verminopolis.

Weeds as Reservoirs of Virus Disease

(from page 11)

feeders and capable of carrying the virus to many host plants. The beet leafhopper is the only known insect capable of transmitting curly top virus, whereas the green peach aphid is able to transmit more virus diseases than any known aphid carriers.

In the case of the beet curly top virus, the winter and spring host is chiefly the red-stemmed filaree, *Erodium circutarium*, which grows abundantly on grassy hillsides and plains everywhere in the middle and southern parts of California. The beet leafhopper, *Eutettix tenellus*, over-winters on this plant which is a favored reservoir of the virus. In the spring, the infected leafhoppers migrate to the valleys on both sides of the Coast Range mountains in middle California and continue to feed and breed on the filaree and also on salt bushes, *Atriplex spp.* and other plants. Along the eastern slope of the foothills and the west side of the San Joaquin Valley the leafhoppers gradually work down into the cultivated areas. On the margins of these are great stretches of Russian thistle, *Salsola kali*, which furnishes food for the insects during the late spring and early summer. These plants also become reservoirs of the virus. Thus laden with the disease the leafhoppers migrate to cultivated fields of melons, sugar beets, tomatoes, and other crops and, in feeding, transmit the virus to these plants. In most cases, during years of abundance of leafhoppers, the crops in these infected fields are total losses. Through extensive studies covering a long period of years, it has been discovered that the leafhopper migrations can be greatly retarded and reduced by spraying the weed hosts to destroy the insects as they progress from the hill areas to the cultivated fields. This work has cost the sugar beet growers and refineries thousands of dollars annually and has been remarkably successful. In recent years these repressive measures have been taken over by the state which has extended the control program to the actual destruction of Russian thistle of several thousand acres of grazing land. At the present time the complete extermination of the Russian thistle is being contemplated as a measure likely to prove most practical in reducing future outbreaks of the curly top virus in the San Joaquin Valley.

Investigations in the control of the bean thrips, *Hercothrips fasciatus*, have shown that the destruction of the wild prickly lettuce, *Lactuca scariola*, which is the most important winter host of this insect, adds very greatly to the reduction and the elimination of the thrips as a pest of field agricultural crops in many sections of California during the succeeding year.

It has also been shown that the elimination of grasses in and around vineyards greatly reduces the numbers of leafhoppers which transmit Pierce's disease of grapevines. Although these leafhoppers do not multiply on the grapevines, yet they do feed sufficiently upon them to transmit the deadly disease which occurs in grasses, alfalfa and other plants growing in and around the vineyards. Here clean culture again appears to be the most effective means of reducing and controlling a virus disease.

It is hardly necessary to pursue this line of argument further to show the great importance of weed control to prevent the great financial losses caused by weeds which act as reservoirs and intermediate hosts of plant virus diseases.

— By E. O. Essig in Journal of Economic Entomology, February, 1948, pp. 58-60.

Bulletins Build Goodwill

People often ask the PCO where they may obtain information concerning insect pests. Interesting and up-to-date information may be found in government bulletins. Price lists for these bulletins can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25.

A. F. C. QUALITY PRODUCTS FOR PEST CONTROL

Chlordane, oil concentrate, liquid emulsifiable concentrate, wettable powder concentrate, and ready-to-use liquids and powders.

Super Fluorex V, powerful insecticide powder

Sodium Fluoride

Poison Seeds

Pyrethrum and **DDT,** powders and liquids

Paradichlorobenzene

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Phosphorous Paste
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NEW LOW PRICES

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COMMENTS by the Editor

Court Action

A RECENT ARTICLE in a Chicago newspaper reports four property owners were fined heavily by a municipal judge for harboring roaches and other vermin in their apartment buildings. Some were fined for not ridding their buildings of rats and failing to seal rat holes. Charges here brought by tenants who had unsuccessfully tried to get their landlords to do something about correcting the pest problem.

This kind of publicity is not desirable for property owners, to say nothing of the expense involved in fines, but it is one way of getting action when reasonable warning has been given and this warning has been ignored. The regular services of a pest control operator could help prevent such occurences.

City, state and federal health officials are following more seriously a genuine policy of inspection, enforcement and education. The importance of maintaining sanitation is being emphasized all around us. PCOs can help building owners get a "clean slate" if the former is kept on the job to control and/or prevent pest infestation.

3 Times as Profitable

ARE THERE PROFITS in over-the-counter sales? was the question asked pest control operators in different sections of the county. Most all agreed that these one, two and three dollar sales help defray office expenses, and realize business that might otherwise go to the corner drug, department or hardware store. They enable PCOs to make new contacts.

Hand sprayers, bulb dusters, mice and rat traps, rat and ant paste, glue boards, roach powders, insecticides, etc., fire extinguishers, soaps, brushes, deodorants and other janitor supplies are among the products handled in the "front-office" sales rooms of the PCOs we visited. Markup on these products is appreciable. One operator told us these small sales are three times more profitable per dollar than is the income from service work. The labor involved is negligible for office personnel can take care of customers that come in. By simple mathematics it's easy to see that a few sales each week will soon add up to enough to cover the month's rent and more.

How many times has a telephone inquiry been forfeited because the caller said he could not afford a service call? In many cases it would cost more to drive out to service these small jobs than could be covered by the charge for it. Yet, these inquiries could be turned into business by offering the proper pesticide and low-cost application equipment. Once sold the customer would come back for refills and would more than welcome the services of a professional PCO, whose advice he has learned is reliable, when a serious infestation comes up that he could not handle himself. We're told the best money is in large jobs anyway and these would not be affected. Small-package sales would save the day by bringing in business that might be turned away.

Over-the-counter sales enable the PCO to take advantage of national advertising sponsored by the manufacturer. We've been given assurance that if PCOs will stock enough merchandise to supply customers brought in by such advertising, manufacturers will mention pest control operators as a place where the public can buy this or that advertised product.

Once we've established the trend and the public comes to the PCO with all their pest problems, we've opened a door to more profitable service business.

No Association

"BEHOLD, the Janitor" editorial in our March issue brought in an unexpected number of letters (one of which is published in this month's Letters to the Editor column) from readers who thought the remarks were pointed. No trade organizations were being referred to, for generally all realize the hazards involved in pest control work.

Equipment

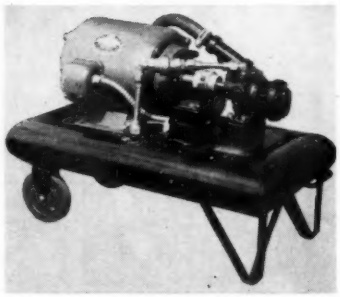
DR. F. C. BISHOPP, Bureau of Entomology and Plant Quarantine, USDA, said recently, "Effective and economical insect control demands proper equipment as well as proper insecticides, suitably formulated."

Usually it's the chemical that gets blamed when a job goes berserk, and control is something you haven't got, when actually the wrong kind of equipment may have been used or perhaps wasn't used properly. The whole subject of equipment is one most operators talk about and few have time to do anything about. Manufacturers need field reports from PCOs using their sprayers, dusters and fogging machines to supplement their own research. How many times have you sent your results to those people who are attempting to build useful tools?

What kind of equipment is best for this or that job? How should PCOs clean the machine after using an emulsion, a water-wettable or oil-bas solution? How should it be taken care of? These are a few questions *Pests and Their Control* will help answer in May. Manufacturers, the National Sprayer & Duster Association and pest control operators have pooled their experiences to write special articles for our May issue.

For Pressure Treating and Spraying

THE AUTOMATIC



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Portable . . . on and off your trucks in a hurry.
Doesn't tie up your truck at the job.
Light enough to handle easily . . . weighs 127 lbs.
Recommended for pressures up to 225 lbs.
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The Ewing Manufacturing Co. also manufactures the Semi-Automatic Preshur-Mite Sprayer in electric or gasoline powered models. They are designed to mix, and keep mixed, those emulsions commonly used by pest control operators.

WATCH for the two NEW Junior Preshur-Mites.

They'll appear in an early issue!

"The choice of the industry and operator"

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SPRAYING SYSTEMS
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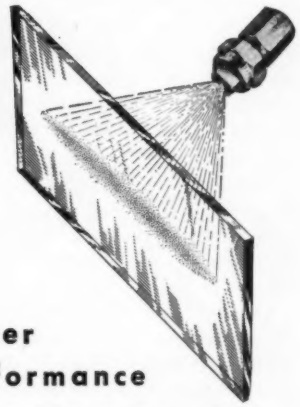
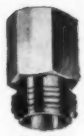
SPRAY NOZZLES





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STRAINER with monel metal screen

interchangeable ORIFICE TIP

better performance

For the residual spraying of insecticides, you will find TEEJET spray nozzles give the uniform distribution and proper atomization necessary for an effective spraying job. TEEJET spray nozzles are precision built with a wide range of interchangeable orifice tip sizes. Write for complete information.

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Letters

TO THE EDITOR

Behold, the Janitor

Dear Sir:

In your editorial entitled "Behold the Janitor" in the March, 1949 issue of PESTS AND THEIR CONTROL I assume that you were referring to the National Sanitary Supply Association's Institute of Sanitation to be held at the Hotel Sherman in Chicago April 4-6. If so, you have evidently been misinformed as to the plan and purpose of the Institute.

There is no "movement afoot to make the janitor a full fledged sanitarian." There is, however, a definite attempt being made to interest more industries, institutions, and commercial establishments in more sanitation and more effective sanitation operations. There isn't even a movement afoot to train the sanitarian to do the work himself, for he is essentially an organizer, supervisor, educator and coordinator, who must depend on engineers, maintenance men and reliable professional services to assist him in making his sanitation program effective.

The participants in this Institute will be well above the level of janitor and will be owners, manufacturers, jobbers, possibly some pests control operators, and a wide variety of industrial consumers.

One of the objectives of this Institute will be to arouse a far greater interest in insect and rodent control than has existed previously, for pest control has been neglected in the better part of industry for too long. Few industries even realize the inroads on their profits made by insect and rodent depredations. However, our interest will be centered entirely on the good housekeeping practices necessary to supplement operations of the Pest Control Agency. The good sanitarian, who is responsible for a program costing thousands and sometimes millions of dollars, does not try "to save a little dough with untrained persons" when the obvious advantages of reliable professional control services far outweigh the cost. Breakdown of pest control operations in industry can frequently be attributed to slovenly housekeeping practices, poor storage arrangements, need for structural repairs, etc., all of which obstruct the efforts of the professional pest control operator.

We feel that by stimulating the Institute participants to the need for increased pest control operations and educating them as to the general problems of such control the best interests of your organization will be served.

Industrial Sanitation Counselors
Staff for the N.S.S.A. Institute
Mohe H. Solworth,
Louisville, Kentucky

Neither the National Sanitary Supply Association, nor its Institute of Sanitation, were being referred to in our editorial of March which brought some well-taken comment. We're glad to see the response to that editorial, in the main, agrees that no one but trained PCOs should handle the toxic pesticides involved in pest control work.

One Source for State Laws

Dear Sir:

Can you advise us where we could obtain information regarding the insecticide regulations in force in the various states? We tried to secure this information from the U. S. Department of Agriculture. All they could suggest was to write to each individual state government. Can you help us

F. G. Garther
The Gart Pharmacal Co.
Woodside, New York

The National Association of Insecticide and Disinfectant Manufacturers, 110 East 42nd Street, New York 17, N. Y., has a service which enables individuals to obtain all the information regarding insecticide regulations in the various states from one source. "The NAIDM Compilation of Laws" is a new 550 page, loose-leaf volume, which can be obtained by sending $25.00 to the association headquarters. An annual compilation of laws, revision and corrections can be obtained for an additional $10 per year.

New Pyrethrum-like Synthetic Insecticide

New pyrethrum-like chemicals that kill insects have been made synthetically for the first time in the laboratories of the Bureau of Entomology and Plant Quarantine, it was announced recently by the U. S. Department of Agriculture. The chemical make-up of the synthetic materials is almost identical with that of the insect-killing principle in pyrethrum, according to the chemists who accomplished this achievement. This remarkable development, comparable to the synthesis of rubber, is the culmination of intensive studies during the past 15 years by Bureau chemist F. B. LaForge and his associates.

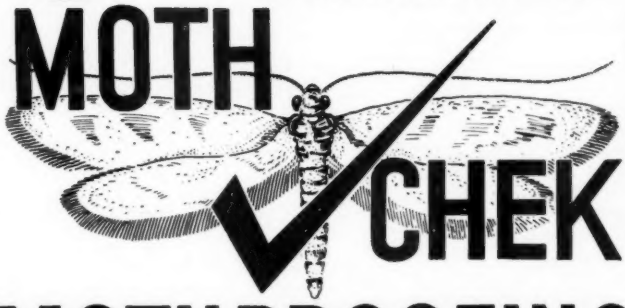
This discovery may be the beginning of the development of a means through chemistry of providing a material which has wide importance in insect control. Much still needs to be done before it can be produced in quantities sufficient to appraise its usefulness fully. Many things remain to be learned before it can be produced commercially.

One of the compounds, tested by entomologist W. F. Gersdorff in the Bureau's laboratories at Beltsville, Md., was found to be six times as toxic to house flies as the combined toxic principles of pyrethrum flowers.

Pyrethrum has been used widely as a household insecticide and for control of a number of important agricultural insect pests. During the war practically all pyrethrum went into insecticides furnished the armed services because of its remarkable effectiveness against disease-carrying insects. It was the principal insect killer in the 35 million aerosol bombs which helped protect our armed forces from malaria and other insect borne diseases.

Applications for patents to protect the invention have been filed and a brief note outlining the method of synthesizing these compounds will be published in an early number of the Journal of the American Chemical Society. A detailed description of all syntheses will be published later.

5 YEAR WRITTEN GUARANTEED MOTH CHEK MOTHPROOFING



A Detroit hotel buys a $1248.00 job of MOTH-CHEK moth proofing for carpeting from one P.C.O. . . . Investigate your potential profits from jobs like this.

MOTH-CHEK is ODORLESS, COLORLESS, STAINLESS. SAVE TIME, MONEY and WORRY.

Every job is guaranteed for 5 years.

PROVEN PROFIT MAKERS FOR P. C. O.'s

WRITE FOR SAMPLES AND DETAILS

FLAME CHEK

The amazing liquid that STOPS the spreading of Flames

Profits . . . More Profits . . . Extra Profits . . . Any way you look at it. One P.C.O. "FLAME CHEK"ED an industrial plant for $3000. Another "FLAME CHEK"ED an auditorium for $900. Can you use "extra" business like this? FLAME CHEK flameproofs rugs, drapes, upholstery, paper, etc. Applied by Spraying. Approved by Fire Departments in 25 big cities and 3 states.

Every job is Extra Profit!

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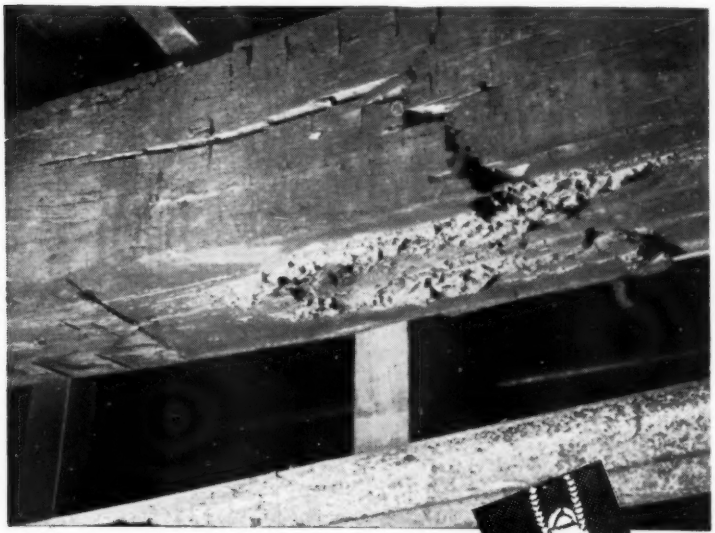

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- Write today for specific instructions on mixing various effective solutions with TERRA TOX.
- Increase your business with mailing pieces that pull the inquiries. Full particulars are yours for the asking.

TERRATOX is available in two formulas, water and oil soluble, both equally effective and easy to use. For even bigger savings TERRATOX is CONCENTRATED, and all you need do is add your own diluent.

Supplied in 1 and 5 gallon cans, 30 and 58 gallon steel drums. We invite your inquiries.

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PCO NEWS...

13 Years For Ohio Extermital

J. L. Purdy, vice president of the Extermital Termite Co., Hamilton, Ohio, announced recently that his company starts its thirteenth year of service in new offices, at 40 Court St. in Hamilton. Extermital was located at 410 Maple Ave.

Prior to 1937 when Purdy was in the contracting business, he became aware of the great problem termite damage and termite control poses for the building industry, and began to experiment with methods of termite prevention. He used the Extermital process, and soon found it more advantageous to devote his entire time to termite control.

Purdy is now serving his third term as secretary-treasurer of the Ohio PCO association, and is a member of the termite committee of the NPCA.

Associated with Purdy are Edward W. Kunkel, who services the Hamilton area; William Piskie, with offices in Middleown; and Don Stitzel, in charge of reinspections and emergency work.

Basketball Honors for Aus-Tex

The Aus-Tex Exterminators basketball team took runner-up honors this year in the Austin City League, Austin, Texas, according to D. D. Wooten, manager-owner of the company. Season results for the team were fifteen wins and two losses.

Wooten feels that this sort of activity is a direct help to the industry because it aids in establishing better relations between the concern and the community, and places the concern as a civic leader.

Stork Calls on Bloomfields

Mrs. Dennis Bloomfield presented a four-pound, fourteen and one half-ounce girl, Andrea Denise, to Mr. Bloomfield, February 16, at St. Mary's Hospital, Orange, N.J.

Proud papa is associated with the Chek Products Co., Inc., East Orange, N. J. The Bloomfields have another girl, Melinda Sue, who is four years old.

CALENDAR OF MEETINGS

New York State Pest Control Assn'n. Short Course. Cornell University, Ithaca, N. Y., April 13, 14.

Pennsylvania Pest Control Operators Short Course — April 14-15-16, 1949 at Pennsylvania State College, State College, Pennsylvania. (Write to Professor H. Frings at Pennsylvania State College for information).

National Sanitary Supply Association Convention, Sherman Hotel, Chicago, Ill., May 8-11.

E. Pennsylvania Pest Control Assn. Meeting, Robert Morris Hotel, Philadelphia, Pa., June 9, 6:30 p. m.

NAIDM Convention, Drake Hotel, Chicago, Illinois, June 13 and 14.

NPCA Convention, Biltmore Hotel, Los Angeles, California, October 17-19.

Gross Speaks to Ent. Society

Joseph L. Gross, associate editor of *PESTS and their Control*, and Education director of the Ohio PCA, spoke before the Columbus Entomological Society, March 7, in Columbus, Ohio, at the Zoology Building of Ohio State University. "The pest control industry as a profession for graduate entomologists," was Gross' topic.

Mrs. Shrimplin Dies

Mrs. Nannie M. Shrimplin, age 83, wife of William J. Schrimplin, Rose Exterminator Company of New York city, died on March 2. Funeral services were conducted at the Fairchild Chapel in Brooklyn, New York. She is survived by Mr. Schrimplin and their daughter, Grace L. Squires.

Pomerantz Talks in Mass. On Rickettsialpox

Charles Pomerantz, President of Bell Exterminating Co., Inc., New York city, and a director of the National Pest Control Association, spoke on "Rickettsialpox" before a number of Massachusetts groups last month. He appeared at the Cambridge Entomological Club, Harvard University, Cambridge, Mass., March 8; the Harvard School of Public Health, Boston, March 9; and before the District Health Officers of the Mass Dept. of Public Health, at the State House in Boston, March 10.

His audiences were warned of the need for controlling mite-bearing rodents in fighting disease in thickly-populated areas.

A self-educated entomologist, Pomerantz described his work in isolating the mite that caused an epidemic of rickettsialpox at Kew Gardens, Queens, N. Y., in 1946. Mice, he said were found to be the hosts of the fever-causing mites.

Identified as a result of Pomerantz's research, the disease was at first believed to be only in the New York area, but its discoverer said other cases have been reported elsewhere since.

Similarity between clinical manifestations of the Kew Gardens epidemic and known clinical reports of mite-borne diseases, both in the United States and abroad indicated that science was on the threshold of an entirely new field of public health, Pomerantz stated.

He reported that these diseases often were mistaken for hives, scabies, typhus, smallpox, and chickenpox, and declared that the cooperation of public health authorities and entomologists was needed to combat them.

Future lectures will be presented at the Connecticut Valley District on April 25, and the Fernald Club, April 26, both are at Amherst, Mass.

Hyman Moves West Coast Office

Julius Hyman & Company has moved its west coast office from 9 Main St., to 25 Beale St., San Francisco 5, Calif. Edward Degginger is manager of this office.

AN EXTRA PROFIT MAKER FOR YOU!

SELL THIS low-priced sprayer for EXTRA PROFIT on Small Jobs

BURGESS vibro-sprayer
Pat. Applied For
No Motor, Compressor or Other Equipment Needed!

All Electric— Just Plug in and Spray!

90-DAY GUARANTEE

Pest control operators everywhere are learning how to make a good thing out of unwanted service calls on jobs too small to handle.

SELL THE VIBRO-SPRAYER!

The handy Vibro-Sprayer is just right for home-owners and operators of tourist camps, restaurants, taverns, small stores, apartment buildings, etc. Urge them to buy the electric Vibro-Sprayer to control pests. There's a big profit on your sale of the sprayer—afterwards you sell your own liquid mixtures for added profit.

SPECIFICATIONS

No air pressure required. Molded phenolic pump housing. 25 oz. Mason jar type paint container. 8' extension cord. Operates on 110-125 volts, 50-60 cycle, A.C. only. Dimensions: 8⅜" high, 6¼" deep, 4" wide. Weight: Unpacked, 2½ lbs. In single carton, 3¼ lbs. Packed 6 per shipper, 20 lbs.

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LOOK AT THESE PRICES!

Quantity	Your Price	List Price	Your Profit
1 Sample Unit	$9.75	$12.95	$3.20 each
2 to 5	8.65	12.95	4.30 each
6 to 23	7.80	12.95	5.15 each
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711 RAND ROAD, LAKE ZURICH, ILL.

NOW HE'S LEGAL

Pest Control Equipment Company's hitherto unnamed orphan — that long-wearing oil-resistant superior hose — now bears the famous PCE Signature. You'll find the familiar name branded into this light strong hose at five foot intervals along its length.
PCE oil resistant hose has a bursting strength of 1500 lbs., and a working pressure of 250 lbs. That gives an ample margin of safety to protect you.

AND LOWER IN PRICE

And along with his christening, PCE oil-resistant hose gets a new low price . . . only 23 cents a foot (33 cents a foot in less than ten foot lengths). Available in ¼" I.D., in any lengths, with or without fittings.

Send in your order now . . . PCE oil-resistant hose is just one of the items we stock for immediate shipment.

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Stops and prevents termite entrance from parent soil colony. Used for treating foundation timbers, infested beams and sills. A gray powder — soluble in water or applied in dry form. Contains 75% arsenious oxide, killing ingredient.

ATLAS "A" Liquid Arsenical

Concentrated sodium arsenite solution. One gallon equivalent to 5.33 pounds of Sodium Arsenite in dry form. Used with equal effectiveness.

Write for Special Circular

CHIPMAN CHEMICAL COMPANY
DEPT. T. BOUND BROOK, NEW JERSEY

NSSA Holds Cleaning Meet

The National Sanitary Supply association will hold its first institute of Sanitation and Modern Cleaning Methods at the Hotel Sherman in Chicago, April 4 to 6, according to Leo J. Kelly, executive vice president of the association.

A three day course will be held for those in charge of the administration of sanitation in plants, hotels, hospitals, schools, department stores, restaurants, and offices. It will be designed to increase the level of sanitation and practical training in sanitation methods as well as theory will be stressed, Kelly said. Insect and Rodent Control will be included in a division of the course.

Termite Movie for Groups

Extermital Chemical, Inc., of Dayton, Ohio, is offering a film entitled "Termites at Work" exclusively to various organizations in Ohio. It is good for service club programs, according to an announcement from W. H. McCain president of the company. Many organizations reportedly have seen and enjoyed the picture.

"Termites at Work" runs for 20 minutes, describes the termites, shows what damage they do, and how they do it.

McCain states that his company furnishes the equipment for running the film, if desired, an operator, who will give a brief introduction and answer questions afterwards. There is no charge for this program. For Ohio groups only.

Monsanto Advances Sherwood

Appointment of Dr. Lloyd V. Sherwood as assistant coordinator of the Agricultural Chemicals Group of Monsanto Chemical Company's Organic Development Department has been announced.

Dr. Sherwood will assist R. W. Towne, coordinator of the group, and will be primarily concerned with the development and applications of herbicides. After joining Monsanto in 1947, Sherwood became active in the herbicide program.

Sidney L. Suib

Entomologist to PCE

Sidney L. Suib, graduate entomologist, has been appointed as special representative of Pest Control Equipment Co., 47 West 43rd St., New York City, according to an announcement by Jack Benmosche of the company. "It is our aim," Benmosche stated, "to implement our slogan of 'complete service for the PCO' by providing the facilities of a trained entomologist for the practical solution of pest control problems which the operator encounters. We feel that Mr. Suib is well fitted for this role both by training and experience."

A graduate of Cornell University, Suib has taken additional courses at the U. S. Department of Agriculture Graduate school. He was attached, as civilian entomologist, to Headquarters Corps of the Engineer Section of the Army, and was assigned to South Korea. While there he planned, organized, and inspected Post Engineer insect and rodent control activities. Before his tour of service, Suib was an entomologist with the Communicable Disease Center of the USPHS in Atlanta, Ga. He is a member of the National Malaria Society and of the Entomological Society of Washington.

Course for Air Operators

Purdue University at Lafayette, Ind., held a short course for airplane sprayers and dusters, March 10 and 11, under the sponsorship of the school of Agriculture and the Technical Extension division. J. J. Davis, Purdue department of Entomology, promoted the two day program.

Jersey City Rat Course

A two-day clinic course on rat elimination, March 1 and 2, sponsored by Jersey City, N. J., was presented by officials of the U. S. Department of Interior and the New Jersey Health Department, at the city's Medical Center.

The course included slides and films showing the habits of rats and a discussion of formulae for their elimination. Participants of the course, health inspectors of the county, Community Nursing Service representatives, Board of Education nurses and Chamber of Commerce representatives made a tour of the rat-infested localities.

Dennis J. Sullivan, chief health officer and administrator of the city's rodent control program, said a campaign is already under way in schools through essay and poster contests. He also reported that inspectors are making regular visits to piers, warehouses, dumps and other breeding places for rats.

City Clerk Francis A. Burke was authorized at a meeting of the city commission, to advertise for dump fumigation bids.

The representatives and Ernest Miles, interior department representative, were welcomed at the opening session by Mayor Frank Eggers.

New Powell Synergists

John Powell & Co., Inc., one Park Ave., N. Y., offers a choice of two synergists in pyrethrum-base formulas, according to H. Alvin Smith, executive vice president.

In addition to Sesamin, the firm will supply Piperonyl Butoxide. It is reported that either product when used in pyrethrum-base formulas increases the killing power and lowers the cost of finished insecticides.

Detailed information may be obtained by writing to the Technical Service department, of the company.

Termite Man at Builders Meet

That termite men must know more about their work than mere measures of control is exemplified by the fact that W. S. Hill of Hill Termite Systems, Memphis, Tenn., thought it important enough to travel to Chicago to attend the National Association of Home Builders' convention late in February. In fact, Hill got his picture in the "Convention Daily" along with the other delegates from Memphis having a dinner at the Palmer House.

New Walton Humidifier

The Abbeon Supply Company, distributors for the Walton Laboratories, Inc., announces that their new junior Walton size humidifier is now in production.

It is designed to take care of medium sized areas, and reportedly requires no steam, no pumps, no compressors, no return lines, and is completely noiseless in operation. The vapor is emitted looking like a fog.

Further information and literature can be obtained from the Abbeon Supply Company, 58-10 41st Drive, Woodside, New York, N. Y.

Hild Has Small Scrubber

A fifth model of their rotary electric scrubbing machines is now included in the line of Hild Floor, Rug and Carpet Equipment. It is available with or without a solution storage tank mounted on the handle. According to reports the new model may be used for both floor maintenance work and for shampooing rugs and carpets. With a series of interchangeable attachments this machine scrubs, waxes, polishes, buffs, sands, or grinds floors.

Complete information may be obtained from the Hild Floor Machine Co., 1313 W. Randolph St., Chicago 7, Ill.

Rodenticide Data Available

Development of an improved carbon-monoxide producing cartridge for the control of woodchucks, prairie dogs and other types of rodents is the subject of a report now available, from the office of Technical Services.

PB 96224, "Rodenticide Cartridge — Pyrotechnical Production of Carbon Monoxide," thirty-six pages, including illustrations and tables, is available at $5.00 in photostat form, $2.25 in microfilm. Orders should be addressed to the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, D. C., accompanied by check or money order payable to the Librarian of Congress.

Bete Joins Lawrence Sprayer

John U. Bete, inventor of the Bete fog nozzle, a unique nonclogging nozzle for fire and pest control, has been added recently to the engineering staff of the Lawrence Aero-Mist Sprayer Co. of Greenfield, Mass. He will be in charge of engineering.

There's profit

for PCO's in these ISCO PRODUCTS!

PCOs recommend LARVACIDE, the penetrating tear gas fumigant, for sure cure of rat control problems. The handy one lb. cans of LARVACIDE are standard equipment wherever they go, for they never know when they'll need this all-around, fast-acting fumigant.

Building fumigation with LARVACIDE can be done with light dosages—¼ lb. per 1000 cu. ft., or, in some cases 2½ lbs. per 1000 sq. ft. LARVACIDE drives rats out of their hiding places to die on the open floor.

Carry the SURE cure on YOUR jobs—in handy one-lb. cans. It's the can that says 'can-do' to rat control.

No. 300 **DDT Iscomist**—5 lb. Bomb containing DDT and Pyrethrum for quick, easy kill of insect pests. **Pyrethrum Iscomist** — for use where DDT is not indicated.

ISCOMIST Aerosol Deodorizer—There is a clean profit in clean-smelling air! While you're on the spot on a PCO job, you can sell your customer on clearing and freshening the air with the new ISCOMIST Aerosol Deodorizer. This Deodorizer does NOT replace one odor with another — it actually kills the odor, thanks to magic Metazene! Takes only four seconds per 1,000 cubic feet. Excellent for offices, banquet rooms hotel rooms, kitchens, hospitals, restaurants, lavatories, stores, funeral parlors, trains, theaters — where odors are a problem.

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NACA Cautions on Improper Use of DDT in Agriculture

The National Agricultural Chemicals Association has just issued a report concerning proper and improper use of DDT on agricultural crops.

Lea S. Hitchner, executive secretary, stated that DDT has been widely used in the past several years, but in many cases was incorrectly applied and resulted in excessive residues on foodstuffs. Realizing this fact, the NACA named a special committee composed of DDT producers to make thorough study of the use of the chemical in agriculture.

Findings of this study are summarized in the report, which places the use of DDT into six categories. Extent of the residue problem in each case, is indicated in these classifications, which are:

1. Nonfood uses where residue is not a problem.

2. Food crop uses where residue is no problem for the reason (a) the crop is highly processed, and (b) edible portion is not exposed to insecticide application.

3. Food crop uses where relatively minor residue problems exist.

4. Food crops where DDT should not be used, or where applications should not be used after formation of edible parts.

5. Food crops where human consumption is not a problem, but where feeding of crop residue (hay, and so forth) to livestock may constitute a problem.

6. A series of special problems upon which further study is to be made to acquire more data on residues.

Specific crops on which DDT has been applied are listed and instances where it may be safely used without danger of residue are named. Also, cases where the pesticide should not be used are named in the report, copies of which may be obtained from the association's headquarters, Barr building, Washington 6, D. C.

Robert E. Evans

Commonwealth Adds Evans

Dr. Robert E. Evans has been recently appointed research director, by the Commonwealth Sanitation Company, Pittsburgh, Pa.

Previously he was director of laboratories in the Evanston, Illinois Health Department. Commonwealth has its headquarters in Pittsburgh and other offices in twelve large cities.

Purdue Questionnaire

Questionnaires passed out at the 13th annual Purdue PCO conference, held February 7 to 11, to choose the pest for the year of 1950, indicate the following preferences of those at the meeting:

Fabric Insects	272
Ants	205
Insects Attacking Foods in Homes	183
Carpet Beetles	145
Invading Insects	133
Cockroaches	93
Flies	23
Rats	19
Grain Infesting Insects	11
Wood Destroying Insects	10
Termites	8
Silverfish	8
Insects Attacking Stored Cereal and Drug Products	8
Mice	7
Box-elder Bugs	4
Earwigs	3
Aphids	3
Industrial Pests	3
Weevils	2
Night Insects	2
Dog Ticks	1
Mealy Bugs	1
Red Spider	1

Choices were marked 1, 2, 3, in order of preference. To make the tabulations, first choice was rated as 3, second choice as 2, and third choice as 1.

'Hopper War Planned

The U. S. Department of Agriculture has issued strong warnings that we may be in for a really large-scale grasshopper invasion this summer. Entomologists from the USDA which studied the grasshopper egg situation from soil tests, have noted that the egg population of certain species has been increasing steadily in the past three years. There has been no serious grasshopper infestation since the terrible depredations of 1936, brought on by the severe drought, but all indications suggest that the cycle has reached its peak and trouble is brewing for farmers and ranchers.

Every state west of the Mississippi, as well as Illinois and Michigan, are likely to be affected, according to the USDA's report. A particularly heavy invasion is anticipated in a 2000-mile belt starting in Canada and working down through Montana, Wyoming, Colorado and Texas. Grasshoppers may not be a serious problem in the hilly, heavily populated Eastern states, since they prefer vast, flat grazing and range-lands.

It may surprise you to know that the average annual toll of grasshoppers for the past 22 years is over 32 million dollars! In 1936 alone, the worst year of grasshopper invasion, they chewed up 102 million dollars in field and grazing crops.

The only possible way a disastrous invasion can be spared us, according to the USDA, is if we are fortunate enough to have a wet spring. In such an event, large quantities of young grasshoppers will be drowned.

Up to recently, the recognized treatment for grasshopper extermination was bran bait mixed with highly toxic poison sewed over the infested areas. Many farmers dislike this method because it is uneven, costly, interferes with harvesting and creates labor problems. Of late, sprays and dusts of the comparatively new poisons, benzene hexachloride, chlordane and toxaphene, have been recognized as effective drugs to liquidate the 'hopper.

Now, several important and conclusive experiments at widely-scattered places, indicate that

benzene hexachloride, chlordane, and toxaphene in aerosol or fog form may be used effectively, while reducing to a minimum the danger of tainting forage and feed.

Two years ago, the University of Nebraska's agricultural experimental laboratory reportedly conducted extensive tests with the well-known TIFA-Todd Insecticidal Fog Applicator — in grasshopper control, using a 2% mixture of 666 at the rate of 25 pounds (total) per acre. The University's research officials declared that they had kills averaging 95% on grasshopper colonies, and long-lasting residues resulted.

For three years, Cornell University in New York has been conducting similar experiments with Todd fog units. It reported grasshopper control on farms treated with chlordane and toxaphene with the effects lasting as long as two weeks from one treatment.

The most dramatic report on grasshopper control on a large scale comes from the Department of Agriculture of New South Wales, which is plagued perennially by the Australian Plague Locust *(Chortoicetes, terminifera)*, a cousin of the American grasshopper *(Melanopolus mexicanus*, et al, and *Camnula pellucida)*. In large-scale experiments during last year's blight, TIFA machines mounted on trucks were driven at right angles to the wind direction, ahead of approaching swarms, and a fog of benzene hexachloride-xylol emulsions was spread over the area at the rate of 2 to 3 gallons per acre. It took approximately 3 minutes to treat an acre.

Reading the official government report: "A pronounced residual effect has been noted, and stragglers as well as succeeding swarms have been killed. It was not unusual to find dead and dying 'hoppers up to 300 yards from the treated areas. This residual effect persisted for periods up to ten days."

Chlordane was also tested in the same manner, and was found to be just as effective, although a little slower, since it is a stomach poison while BHC is a contact poison.

The report concluded: "The use of insecticidal fogs which may be drifted over mass 'hopper swarms has indicated an effective modern method of control. Recently developed ground equipment for producing these fogs overcomes the many hazards and disabilities associated with the use of either fast- or slow-flying planes."

Neat Blotter

The Pied Piper Service, with offices in Fernumsville, Mass., and Providence, Rhode Island, is using an attractive blotter to advertise its services. Printed in blue on white stock, it says "Pests Are Optional Today" in white on blue at the top of the blotter. A wavy, white panel through the middle reads, "For Satisfactory Pest Control Service, Call Pied Piper Service" and the address. White on blue wording at the bottom informs the reader that this PCO is a member of the Connecticut Pest Control Association.

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ORGANIZATION NEWS...

Picture taken at Iowa PCA short course, March 3, 4, 1949

114 Southern PCOs Attend Ninth Annual Conference

The ninth southern PCO conference was held at Louisiana State University, Baton Rouge, La., on January 27, 28, 29, 1949, with Professor O. W. Rosewall as chairman. A total of 114 registered.

During the first morning session, after a welcome by Dean Howe of LSU and a response by Dr. C. A. Trimbos, Mr. J. W. Meehan, Jr., discussed "Safety for the PCO." Dr. G. H. Chapman, of American Cyanamid, led a discussion on fumigation problems and W. E. Anderson, Commissioner of Agriculture for Louisiana, talked on "Louisiana requirements for termite control work." Anderson was followed by William O. Buettner who summarized the "Status of termite control work in the South."

H. O. Abel presided over the afternoon session on termites with W. B. Hill, Jerry Howell, Bob Couhig, A. Zimmern and R. P. Turnley participating. Buettner then presented a summary of termite control problems, in different sections of the country, and told how difficult it is to bring the varying points of view together.

During the evening session, Dr. Trimbos delivered a discourse on problems of ant control with additional comments by C. R. Blair.

(Continued on page 41)

Iowa PCA Holds Short Course, March 3, 4 in Ames

Election of officers and a short course on pest control comprised the annual business meeting of the Iowa Pest Control Association held at Iowa State College, Ames, Iowa, March 3 and 4.

Officers elected were: Jo A. Robar, President; C. L. Brookstra, vice president; Vern Walls, secretary and Joe Lopshie, treasurer.

Registration, committee meetings and exhibits preceded the Thursday morning talk "Sanitation Practices for Communities" participated in by Dr. Harris, chairman, C. C. Potter and Joseph Hunt.

"New Chemicals as they Affect Wildlife and Fish" was the subject of the first lecture in the afternoon, by Robert Moorman. He was followed by Dr. Gunderson, who spoke on "Equipment for Fly and Mosquito Control," and gave a summary of recommendations for their control in 1949.

A banquet was held in the evening, followed by a business meeting, with Jo Robar presiding as chairman.

Michael Lynsenko talked on "Pests of Man" Friday morning. He was succeeded by Dr. H. H. Knight, who discussed "Pests of Household Pets." After lunch, election of officers was held and the formal program began with a talk on "Household Pests" by Robert DuChanois.

The following people were present: Earl D. Anderson, Roy H. Anderson, W. R. Anderson, William H. Becker, Jr., Norman Bergstrom, Robert D. Bosch, Sheldon Boyle, Bert D. Brayton, Raymond Breazeale, C. L. Brookstra, Merrill L. Clemans, O. L. Dennis, William J. Findley, Le Gear, Dick Buresh, Homer S. Hasting, Vernon Iiams, E. R. Jessen, Joe G. Lipschie, John P. Linn, William W. Lustfield, W. L. McDowell, Max Melton, Robert L. Manville, John H. Matson, Jack M. Mathews, Elmer L. Meyer, Fred M. Michele, John D. Mock, Robert Murrison, E. Otta, Jo A. Robar, Perry Tobets, Henry Suechtink, S. F. Steenburgh, E. Steinhauer, Vern Walls, Kay Walls, L. Weber, an Harold J. White.

Davenport, Iowa, will be the location of the next business meeting, to be held in September.

Illini PCOs Hear Buettner

NPCA, executive, William C. Buettner spoke at a dinner commemorating the 10th anniversary of the Illini Pest Control Service, Inc. on February 15. "Pest Control and Our Clients" was the subject of his speech. He reminded the audience that, "The days when the pest control man sneaked in the back door are gone. It's no disgrace today to have pests. It's a disgrace to keep them."

NY PCA to Meet at Cornell

A two-day meeting of the New York State Pest Control Association will be held at Cornell University, on April 13 and 14.

Ninth Southern PCO Conference

(from page 40)

Ant control aroused much interest and it became apparent that ants were such an important problem in the southeast and southwest that more time should be devoted to the matter of ants and their control at future conferences.

L. S. Bridges led off on the subject of 1080. Following this Bill Buettner gave a hard-hitting, frank talk on this important topic.

"Ectoparasites" were studied on the second day of the conference with Herman L. Fellton, of the Orkin Exterminating Co., Atlanta, Ga., presiding. Fleas, ticks, mites, lice, mosquitoes, bedbugs, scorpions, spiders, centipedes, sandflies, blackflies, and gnats were studied. Carl O. Mohr and Ralph C. Barnes, of the Communicable Disease Center, U. S. Public Health Service, covered the life histories and habits of these various ectoparasites. After each talk there was a period for discussion on control measures. During the discussions specimens, moving pictures, and projection slides were used as illustrative material.

The annual banquet was held on the evening of the second day. Ted Oser served as toastmaster and reportedly kept things moving nicely, to everyone's enjoyment. PCO Guy Brown, was presented a special diploma as a token of his achievements at this and previous conferences.

Glenn Burnett presided over the closing Saturday morning session. Since Harvey Sturgeon could not be present, Burnett read his paper on the "Control of Mice." C. E. Smith, E. H. Floyd and L. D. Newsom, of the Louisiana State University experiment station presented discussions and demonstrations on wetting agents, mixtures, emulsions, and formulations.

Robert Couhig was called away from Baton Rouge so that the mothproofing demonstration was then presented by Bill Sharp. J. C. Redd followed with demonstrations of fly control, and H. L. Belle, demonstrated pest control apparatus.

Louisiana PCOA Meets

Members of the Louisiana Pest Control Operators Association held a meeting, January 26, at the Hotel Heidelberg, in Baton Rouge, La.

President Joe Mandelbaum and Secretary-treasurer R. E. Couhig, were re-elected as association officers for 1949.

Short speeches were given by William Buettner, executive secretary of the NPCA; W. E. Anderson, Commissioner of Agriculture of Louisiana, and Edwin Lott, secretary of the Louisiana Pest Control Commission.

The following people were present: J. H. McBride, W. D. Merdes, Thomas P. Dutsch, Thomas H. Rowe, J. C. Redd, J. C. Martin, R. W. Temple, R. E. Couhig, J. H. Hewitt, Herman L. Fellton, Joe Mandelbaum, H. A. Bailey, Ray Stafflefield, James W. Wilson, H. O. Abel, B. D. Babcock, Edwin Lott, J. C. Thompson, W. O. Buettner, B. F. Jones, Jr., Leon Burks, Grady Sartor, Paul E. Adams, William A. Sharpe, C. R. Blair, Theodore Oser, M. R. Rogers, C. B. Anderson, D. Miller and Kelly Spence.

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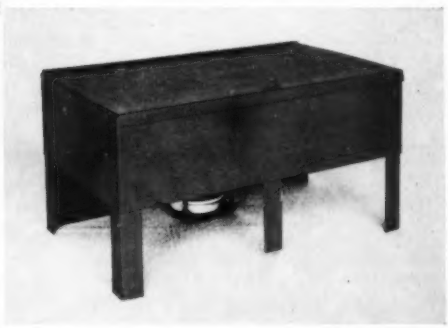

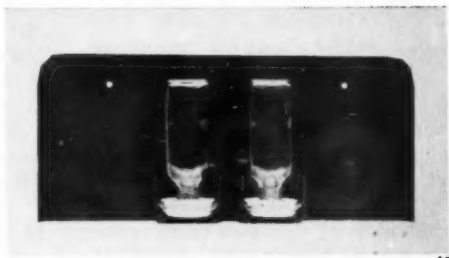

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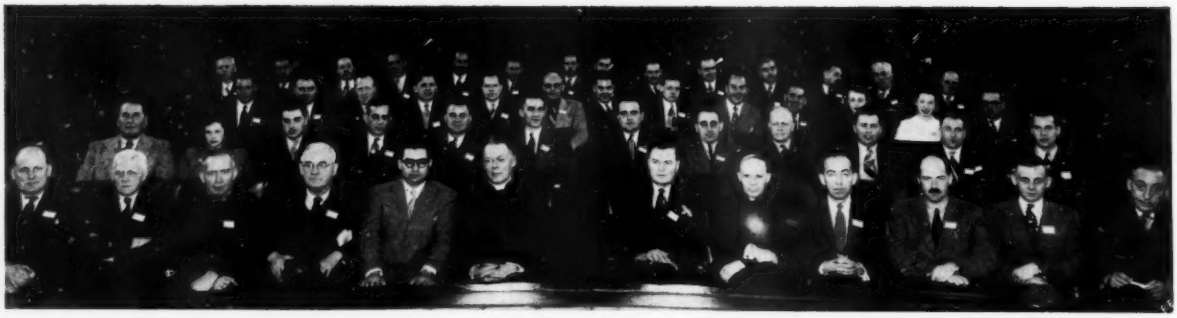

Composite picture of group attending 7th Canadian PCO Conference

Canadian PCOs Hold 7th Annual Conference

Canadian PCOs attended their seventh annual conference at the University of Montreal, Canada, February 14, 15, and 16.

Charles Riess, President, of the Canadian Pest Control Operators Association, opened Monday morning's program with a response to the welcome extended by Mgr. Olivier Maraults, Rector, University of Montreal.

Basic courses were included in this first morning session. They were: Fundamentals in Morphology, "Why is an Arthropod," by Prof. A. Robert, University of Montreal; Fundamentals in Biology, "Life, Cells, and Metazoa," by Prof. O. Fournier, assistant director of General Biology and Zoology, at the University; Fundamentals in Chemistry, "Importance of Chemistry in Pest Control," by Paul Dubreuil, service supervisor of Mysto, Inc., Montreal; and Principles of Pest Control, "Factors Affecting Pest Control," by Prof. E. R. Bellemare, with the Institute of General Biology and Zoology at the University.

That afternoon a symposium on "New Pest Control Chemicals and Formulations" was led by Dr. C. R. Twinn, Chief Entomologist in the Dept. of Agriculture, Ottawa, Ont. Subjects discussed by the following men were: Chlordane, George Flemming; Pyrenones, E. H. Wolfe; DDT, W. M. MacLean; Methoxychlor and Benzene hexachloride, G. R. Snyder; and Sodium Fluoroacetate, (1080), S. R. Annett.

At the clinic, Application of Pest Control Chemicals, which followed, these topics were included: "Boat Fumigations" by Sol Emanuel; "Spot Fumigation" by F. S. Furman; "Sprayers and Formulations" by Jack Benmosche; and "Uses of Fogging in Pest Control" by G. W. Linen. A general discussion followed these talks.

Tuesday morning's schedule consisted of two sections: "Ants and Their Control," in which the Pharaoh's, Carpenter, and Cornfield ants' external structures and classification were discussed by Prof. Robert; their Biology and Life Habits were covered by Louise Brunelle; and Control Methods discussed by Prof. Bellemare. "Bats and Their Control," was the subject of the second section led by Jack Rudick. This was followed by a general discussion.

The afternoon session was based on "Pest of the Year," Ectoparasites. These included: parasitic mites, ticks, sucking and biting lice, and fleas. Morphology and classification was discussed by Prof. Fournier. Dr. E. M. Port talked on their biology and life habits. Control methods were brought out by Dr. F. O. Morrison. A quiz on Ectoparasites and their control followed these talks.

William O. Buettner, executive secretary of the NPCA, served as moderator for the evening program, "Taking Down Our Hair." Here members were invited to introduce any subject which could be discussed for the good of the industry. Subjects previously announced for the program were: Mouse control data by Jack Rudick, Government contracts by Sol. Emanuel, Weed control by F. S. Furman, and Insurance by Howard Hutchison.

The final morning program consisted of a Fly Control symposium in which these subjects were discussed; "Fly Resistance to Chemicals" by H. A. U. Monre, and "Fly Control Failures" by Prof. Bellemare. A quiz on fly control followed. F. E. Bohman gave a talk on Rat Control Legislation and 1080, accompanied by remarks on the Safety Angle of Rodent Control by Buettner, in the second section that morning.

Prof. Bellemare was chairman of the last afternoon session, which consisted of three parts. The first consisted of the answers to the quiz on Ectoparasites and their control, succeeded by a discussion. The Fly control quiz answers were given in the second portion, followed by a discussion period. Answers to questions submitted in writing by members on special "What is your problem" forms composed the third section.

Dr. H. G. Crawford, Dominion Entomologist, was guest speaker at the annual banquet, held Wednesday evening at the Windsor Hotel, in Montreal. This concluded the three day conference.

Canadian PCOA Elects Officers

Officers for 1949-50 were elected at the annual business meeting of the Candian Pest Control Operators Association, March 17, in the Windsor Hotel, Montreal, Canada.

Elected were: Mr. Charles Riess, president; W. O. Maheu, eastern vice president; D. W. Sanderson, center vice president; J. W. Alderson, western vice president; Jack Rudick, secretary-treasurer; Directors, Victor Prentice, Eugene Bellemare, A. R. Huntingdon and J. J. Parent. J. L. McNulty, is the liason officer.

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"Let us strengthen your position by supplying chlordane formulations designed to meet your most critical specifications. Price schedules are furnished upon request.

(If you have not yet received your copy of "Short Cut Calculations for the PCO", please inform us. You will find this information most helpful in diluting concentrates.)

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Missouri PCA Hears Smith

Roger C. Smith, Entomologist at Kansas State College, spoke on general pest control at the Missouri Pest Control Association meeting, held in Columbia, Mo., on February 19.

Following this a report on the Kansas City Rodent Control program was given by Dr. Lloyd L. Gates, of the Kansas City Health Department. Joseph Hunt of the U. S. Public Health Service and John L. Sadowski, with the St. Louis Health department, then made a few remarks on Rat Control. Brief reviews of the Purdue conference were presented by Arthur Ochs and Reynold Shuyler to conclude the session.

Thirty-nine people attended the meeting, 19 members and 20 visitors.

At an earlier meeting the following officers were elected; A. J. Danella, President; J. O. Millspaugh, vice president; and Roy Mason, secretary - treasurer. Thomas C. Raley, H. J. Hall, Reynold Shuyler, and W. F. Exner were appointed as directors.

Members were placed on the following committees: Membership, chairman, John Karleskint, Charles Maly, James C. Logan, George A. Dyche, and Milton J. Milberger; Legislative, chairman, Charles Denny, Reynold Shuyler, and James C. Logan; Insurance, chairman, W. F. Exner, G. L. Clem, and Thomas C. Raley; Program and Education, chairman, U. O. Hawks, and Henry L. Sherman; Termite Control, chairman, Arthur Ochs, Reynold Shuyler, and Steve Spiegelhalter; Rodent Control, chairman, Henry L. Sherman, F. R. Andrews, and Miss Les A. Sain; Fumigation, chairman, Leland L. Wicker, Roy McCullough, and H. J. Hall.

NY PEA Has Fly Symposium

A symposium on "Flies" was attended by the Professional Exterminators Association, Inc., March 14, at the American Museum of Natural History, 77th St. and Central Park, New York city.

Sixty members and guests were present, including Dr. John B. Schmitt of Rutgers University, according to Joseph Finneman, a director of the organization.

PESTALES

But Who Sweeps Up?

There's something new in mousetraps, and squeamish housewives who like their mice at a distance, undoubtedly will beat the proverbial path to the door. It's an all-metal trap that ejects the dead mouse and resets itself — all in one simple motion, by pressure on a lever.

* * * *

Love Call Traps Mosquitoes

DDT was tried and failed. Sticky paper proved ineffective. The scientists were at their wits end. Finally one of them remembered the tale of the sailors who were lured to their destruction by the call of sirens. That's how 40,000 male mosquitoes were finally massacred in a Cuban swamp by Cornell University scientists— equipped only with a phonograph record.

They trapped the love-sick mosquitoes by playing the record near the swamp. To an ordinary man the record made no sense. Amplified it was just a buzzing noise, less ominous in sound than the buzzing made by a mosquito who's getting ready to jab his plunger into your arm on a hot summer's night.

This particular low and soft buzzing was the mating call of the female mosquito, *Anophiles albimanus*, to be scientifically correct. The scientists had trapped the female of the species first to prove she's more dangerous than the male and recorded her various buzzing calls. Finally they hit upon the right one, her plaintive request for a mate.

The record was set-up inside a small box, fitted with wires and designed to be an "electric chair for mosquitoes." Then the record was played. 40,000 unsuspecting male mosquitoes came a-winging, heading right for the box and electrocution.

There's no report on the fate of the female mosquito siren who lured the suitors to their deaths.

* * * *

A Cure to Kill

A Los Angeles PCO, whose office is near the medical center, carries this sign: "All my patients die!"

New Trap Scares 'Em to Death

Gene Mahler, a compositor on a Cleveland newspaper, faced a bewildering situation some time ago. It all started when Mahler, noticing a few rats near the chicken house at his home set a trap.

This was a new spring trap he bought because the old trap was ignored by all rats, even though baited with pork sausage. Mahler set it outside the hen house, the first night, baited with sausage and in the morning he found it, sprung, bait still there.

Our self-appointed PCO became confused because there was no sign that a rat had been in any way inconvenienced by the springing trap — until he looked three feet away. There was a dead rat.

That night Mahler set the trap again. Next morning the trap was sprung, the bait was there, and three feet away was a dead rat with no signs of violence on its body. After this had occurred four nights in succession Mahler was muttering in his type.

One night shortly afterwards he entered the hen house to see a stunned rat shaking its head, beside the recently sprung trap. Evidently the new trap was so sensitive it killed the rats by barely striking them as it went off.

(Beats 1080, doesn't it?)

* * * *

Pup Eats It Up

A letter from one of our potential subscribers recently requested that we send her another issue of Pests and their Control, "because my puppy has just consumed the copy loaned to me and I must replace it at once."

(Keep up the good work; pooch.)

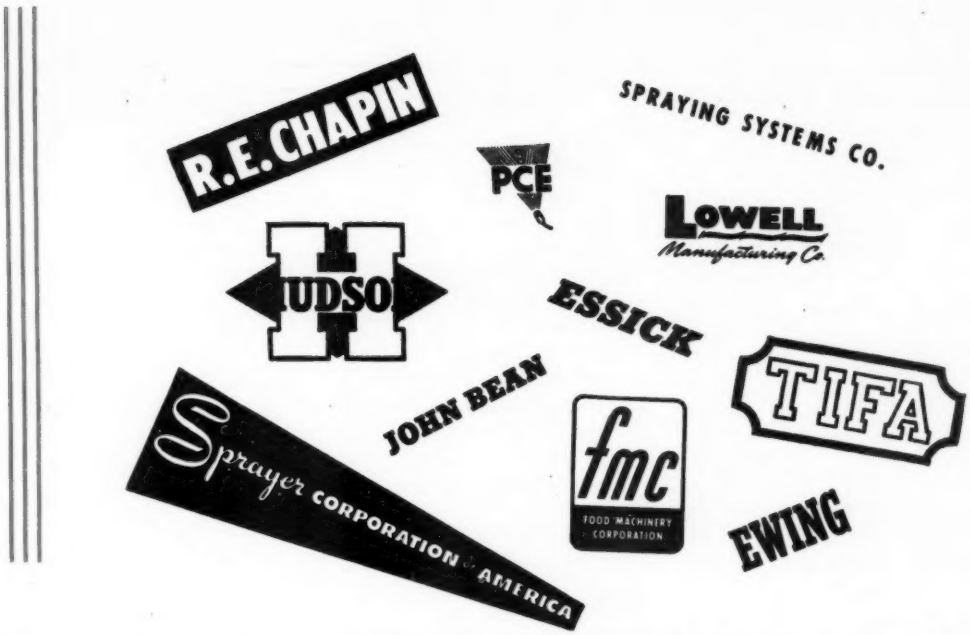
* * * *

Cats Die Off, Rats Show Off

An epidemic of what farmers are calling "cat flu"' is killing off the cats in eastern England. The Ministry of Agriculture said many kinds of drugs and serums, including sulfa, have been tried but nothing has helped.

Rats, meantime, grow bolder. Some stroll around farmyards in the broad daylight.

(What is the old saying? "When the cats are sick, the rats are thick," etc.)



May Issue of PESTS and Their Control

will be the

SPRAYER ISSUE

. . . with last-minute, specially written articles on kinds of equipment available, how to take care of it, and what to look for. Edited to supply the 2150 paid subscribers of **PESTS AND THEIR CONTROL** (the country's leading pest control operators) with much needed information on this important part of their business. The success or failure of many pest control jobs depends upon the use of proper application equipment.

Here's an excellent chance for manufacturers and distributors of sprayers, dusters and other application equipment to advertise their lines for this industry.

The Famous Sprayer Names Shown Above

use PESTS AND THEIR CONTROL because this monthly trade magazine provides the most economical way to reach a $50,000,000 industry and avoids costly, waste circulation. It costs less than three cents to reach every paid subscriber.

This Issue Will Stimulate Equipment Sales

The May issue will sell more sprayers, dusters and foggers for they will be the main interest. Of course, the other regular features found in each issue will be included, but the emphasis will be on application equipment.

WIRE YOUR SPACE RESERVATIONS NOW

PESTS *and their CONTROL*

★

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When answering ads where box number only is given, please address as follows: Box number, c/o Pests and Their Control, 1900 Euclid Building, Cleveland 15, Ohio.

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Former fumigator, owner - operator and solicitor, with 25 years experience with HCN in all forms, wants position as solicitor or supervise industrial fumigation. Season contract. Write: William J. Hale, 1611 South 12th Blvd., St. Louis 4, Missouri. Phone: Chestnut 7138.

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Am interested in buying past issues of Pests Magazine covering years 1946 and 1947. Please submit available list to: Sanitation Department, American Institute of Baking, 113 Fullerton Avenue, Chicago, Illinois.

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250 Gallon Tank Trailer. Ideal for carrying additional termite material. Has platform in front to carry small pumping unit, or three 15 gal. drums of concentrate. Price $500 f.o.b. Jersey City. Sanitary Exterminating Corp., 219 Monticello Ave., Jersey City 4, N. J.

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One pound cans war surplus Methyl Bromide, 48 to case. Minimum order 10 cases. Full weight guaranteed. 22c per pound, f.o.b New York city. Berk Co., 305 Broadway, New York, N.Y.

ADVERTISERS' INDEX

Acme Protection Equipment Co. Mar.
Albia Products Co. 21
American Cyanamid Co. ..3rd Cover
American Fluoride Corp. 29
American Smelting & Refining Co. 43
The Antimite Co. ..... Mar.
Associated Sales & Supply Co. .Mar.
John Bean Division,
Food Machinery Corporation ..15
Broadway Rubber Corporation ..39
Burgess Battery Co. 35
California Spray-Chemical Corp.... 4
Carboloy Company, Inc. ..... Mar.
R. P. Cargille 27
Chapman Chemical Co. 8
Chek Products Co. 33
Chipman Chemical Co. 35
Cook Chemical Co. ..... 4th Cover
Craft Chemical Co. 41
Cre-O-Tox Chemical Co. 17
The Dow Chemical Co. ..... Mar.
E. I. duPont de Nemours & Co. .Mar.
Essick Manufacturing Co. 17
Ewing Manufacturing Co. 31
Exterminators Equipment &
Safety Supply Co. 23
Joseph Gabos 23
Gallant Termite Barrier, Inc. ..Mar.
Geigy Company, Inc. ..... Feb.
Thos. W. Houchin Corp. 43
Julius Hyman & Co. ..... Mar.
Innis, Speiden & Co. 37
Kennametal, Inc. 23
Lethelin Products Co., Inc. .... Mar.
Michigan Chemical Corp. 13
Mine Safety Appliances 21
Monsanto Chemical Co. 24, 25
John Opitz, Inc. ..... Mar.
S. B. Penick & Co. 29
Pennsylvania Refining Co. .... Mar.
Pest Control Chemicals 15
Pest Control Equipment Co.
3, 29, 35, 46
John Powell & Co. ..... 2nd Cover
R. J. Prentiss & Co. 21
Residex Corporation 43
Solvay Sales Division,
Allied Chemical & Dye Corp. Mar.
Sprayer Corp. of America 27
Spraying Systems Co. 31
The Termitol Company 27
Todd Shipyards Corp.,
Combustion Equipment Division 6
U. S. Industrial Chemicals 15
Velodent Products Mfg. Co., Inc... 43
Velsicol Corporation ..... Feb.
B. & D. A. Weisburger 31
Wisconsin Alumni Research
Foundation 13
Wood Treating Chemicals Co. 33

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Established Candian company dealing in insecticides, pest controls and equipment will welcome inquiries from American interests desiring representation in this field. Write:
Box 214, Pests and Their Control

Wandering Sheep

Pests' editor is tearing his hair because some back copies are missing and thus preventing him from having a complete bound set for ready reference when subscribers seek answers about specific articles. Missing copies are those for March, April, May, June, August, and December 1933; January, 1935, February and July 1944 and March 1945. Readers are asked to come to the editor's rescue and save his hair by sending in any of the missing copies they can spare.

SPECIALIZED SUPPLIES . . .

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The most generally used fumigant in the Pest Control industry. More dwellings, industrial buildings, railroad cars, ships and stored commodities are fumigated with hydrocyanic acid gas than with any other fumigant. Commercially pure hydrocyanic acid gas absorbed in thin cellulosic discs. One-pound and forty-ounce containers readily accommodate dosage requirements. AERO HCN DISCOIDS are simply scattered from the can. No dirt or mess in application or clean-up. Where insects and rodents are a problem in enclosed spaces AERO HCN DISCOIDS provide the answer.

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The ideal outdoor fumigant for "cleaning out" rat harborages in city dumps, sanitary fills, under sidewalks, tight floors and pavements, and in fields, along ditch banks and levees. Applied effectively and economically with the handy CYANOGAS FOOT PUMP.

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The liquid "spot" fumigant used for the destruction of insects by direct application to food-processing machinery. Indispensable for servicing flour mills, bakeries and similar food-processing plants. Not a general space fumigant.

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This soil poison gives longer and greater termite control than is usually expected of a soil treatment. Because it is applied dissolved in oil, Du Pont Soil Compound NC does not leach or seep with intermittent rainfall. Used crankcase oil is an excellent carrier, but kerosene or fuel oil is also satisfactory. To give effective control, only four ounces of this compound are required per cubic foot of soil.

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